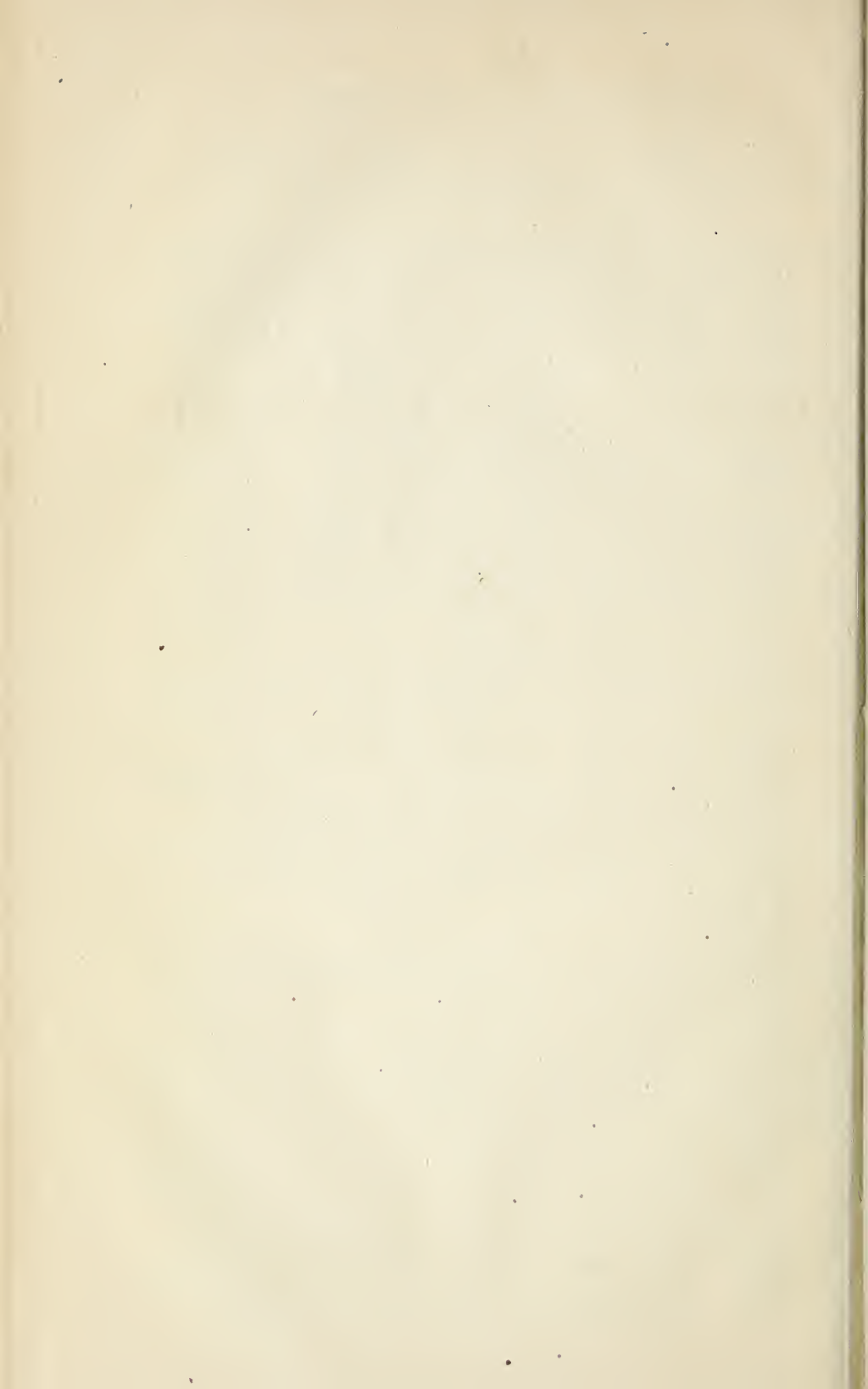


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MONTHLY REPORT

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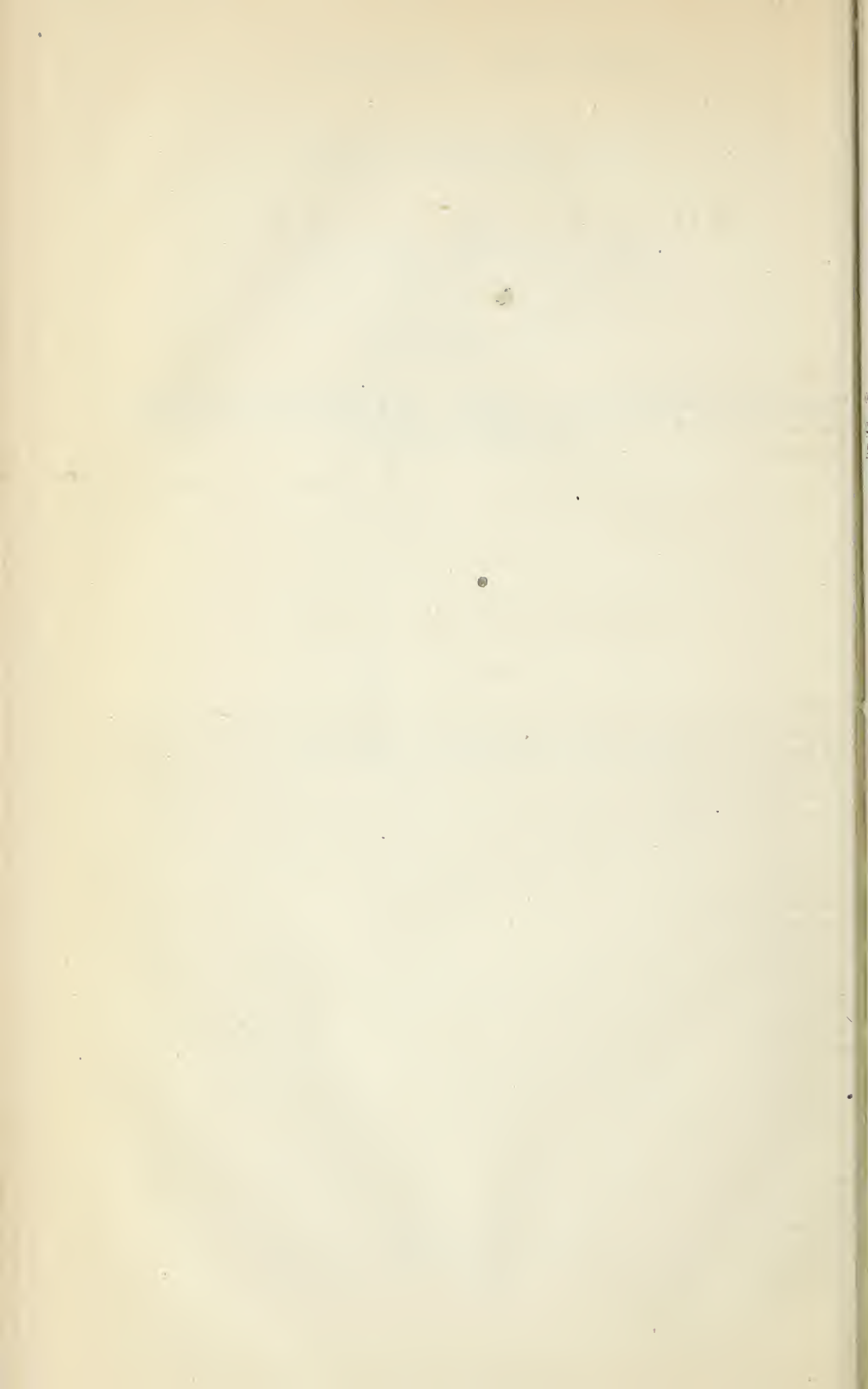
DEPARTMENT OF AGRICULTURE

FOR

OCTOBER, 1872.



WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1872.



# MONTHLY REPORT

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DEPARTMENT OF AGRICULTURE,

*Statistical Division, October 22, 1872.*

SIR: I herewith present, for publication, a statement of the condition of the crops in the first week in October, with results of current investigations in the statistical and other divisions of the Department of Agriculture.

J. R. DODGE, *Statistician.*

HON. FRED'K WATTS, *Commissioner.*

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## CONDITION OF THE CROPS.

### WHEAT.

The New England States fail to report an increase in the product of wheat, with the exception of Maine. In the Middle States the falling off has been quite marked, the crop not having recovered from the effects of freezing in the winter. In the South the product is much larger than usual, both from increase of area and from superior condition. In Missouri, Kansas, Michigan, and Ohio, the crop will be short; in Indiana and Illinois about the same as that of last year. The percentages of States making an increase are as follows, the comparison being with the product of last year: Maine, 109; Virginia, 101; North Carolina, 136; South Carolina, 113; Georgia, 181; Alabama, 133; Mississippi, 101; Texas, 320; Arkansas, 102; Tennessee, 200; West Virginia, 104; Kentucky, 175; Indiana, 101; Wisconsin, 121; Minnesota, 130; Iowa, 112; Nebraska, 140; California, 175; Oregon, 105. A decreased product appears in the following States: New Hampshire, 98; Vermont, 95; Massachusetts, 90; Connecticut, 96; New York, 70; New Jersey, 80; Pennsylvania, 60; Delaware, 75; Maryland, 66; Ohio, 85; Michigan, 86; Illinois, 98; Missouri, 60; Kansas, 80.

Returns from counties representing two-thirds of the production of Maine average 9 per cent. increase over the product of last year. The estimate of Oxford is 115, Penobscot and Somerset 105; Waldo returns 150, York 102, and less important counties range from 90 to 110.

The figures for New Hampshire counties range from 85 to 105, Strafford making the most favorable return and Sullivan the smallest. Hillsborough, Grafton, Belknap, and Coos report 100, Rockingham 90. The average for the State is 2 per cent. less than last year.

Most of the Vermont reports indicate an average production, the lowest return being 75 from Addison, a wheat-growing county. The average is 95 for the State.

Few counties in Massachusetts give much attention to wheat-culture, more than half the total product being grown in Worcester and Franklin, the figures for which are respectively 100 and 75; State average, 90.

The Connecticut average is 96. New Haven and Hartford, among the principal counties, each return 100, and Middlesex 90.

The crop in New York is a short one, the average being 70. Six counties, which usually produce more than a third of the crop of the State, and in 1869 yielded four millions of bushels, are represented as follows: Niagara, 90; Livingston, 50; Ontario, 60; Genesee, 66; Steuben, 78; Seneca, 20. Of twenty-seven counties reporting, representing the larger portion of the crop, eleven return 100 or over, all but one of which are comparatively insignificant in their effect upon the average. Jefferson, which produces nearly a quarter of a million bushels, is represented by 115, the largest estimate reported.

Eleven counties in New Jersey, which grow two-thirds of the wheat in the State, average 80. The large producers are thus returned: Hunterdon, 50; Warren, 60; Salem, 105; and Burlington, 90. The generous and tractable soil of Salem, which has practically great depth without deep plowing, sustains its reputation for reliability under climatic difficulties. Cape May shows an increase in product of 20 per cent., though the amount grown is still small.

Reports from thirty counties in Pennsylvania, which produced about thirteen millions of bushels in 1869, make an average of 60. Lancaster, yielding usually two millions, is placed at 50, and York, where a million bushels are regarded as a small crop, at 42; while Berks gives 60, Franklin 30, Cumberland 100, Westmoreland 93, Lebanon 33, and Bucks 70. These eight counties yielded an aggregate of nearly seven millions of bushels in 1869, or more than a third of the crop of the State, none producing less than half a million of bushels. Only seven counties report 100 or above: Crawford and Forest, 110; Clearfield and Elk, 105; and Cumberland, Montgomery, and Wayne, 100.

The Maryland average is 66, indicating two-thirds of a fair crop. The range of the several counties is from 30 to 115, in Cecil and Montgomery respectively, Charles returning 110; Howard and Caroline, 100; Talbot, 80; Anne Arundel, 75; Frederick and Baltimore, 60; and Carroll, Worcester, and Washington, 50.

In Virginia the average is 101, though the local reports are variable, favorable returns coming from the best lands and well-cultivated fields. The return from Clarke is 60, yet many farms on the Shenandoah yielded well, one field of inferior promise giving 394 bushels upon 24 acres.

We have wheat-returns from forty-six counties in North Carolina, which produce three-fourths of the crop, showing an average increase of 36 per cent. The increase is equivalent to fully a million bushels in the State. The largest percentage of increase appears in Person, Warren, Chatham, Mecklenburgh, Gaston, Rockingham, Clay, Stokes, Stanley, and Montgomery Counties.

The increase appear to be but 13 per cent. in South Carolina, from the counties reported. Reports from thirty-two counties in Georgia, which represent more than half the product of the State, make an average increase of 81 per cent. The same ratio of increase would increase the product more than a million bushels. The increase is heavy in Murray, Fulton, and Milton Counties. Alabama reports indicate an increase of 33 per cent. The crop is scarcely known in Mississippi and Louisiana.

The wheat-reports from Texas are not general, yet they represent



nearly half the crop of the State, and indicate an increasing interest in wheat-growing. Dallas, which yielded 60,000 bushels in 1869, returns a three-fold increase upon last year.

There appears a slight increase of production in Arkansas. In Tennessee, which produces twice as much wheat as all the Gulf-coast States together, an increase of 100 per cent., or fully five millions of bushels, is indicated.

Among the principal counties of West Virginia, Jefferson, Berkeley, and Mason give an increased product, while Marshall returns but 35 per cent. The average is 104. Monroe claims the largest crop in ten years.

The crop of Kentucky was very short last year, which gives a favorable aspect to the present comparisons, the average being 175, and indicating an increase from four millions of bushels to seven. Christian, Shelby, Mercer, Spencer, and other counties claim to have doubled their last production.

Returns from counties producing two-thirds of the wheat in Ohio make an average of 85. Among the counties growing from a half a million to a million bushels, the record stands: Seneca, 90; Miami, 90; Starke, 90; Darke, 80; Butler, 105; Logan, 45; Hancock, 95; Tuscarawas, 90.

A decreased yield of 14 per cent. is apparent in Michigan. Cass, Jackson, Kalamazoo, Van Buren, and Berrien, all large producers, promise enhanced production; Barry, Hillsdale, and Saint Joseph, an amount equal to that of last year; and Lenawee, Ionia, Livingston, Ingham, Genesee, Lapeer, Washtenaw, and Shiawassee, a reduced yield.

Returns from forty-six counties in Indiana, which produced about fifteen millions of bushels in 1869, indicate an average of 101 in comparison with the crop of last year. Of the counties usually yielding not less than half a million of bushels, the following averages are reported: Madison, 120; Shelby and Parke, each 110; Johnson, 100; Saint Joseph, 90; Kosciusko, 80; La Porte, 70. The "best crop in twenty years" is claimed in Daviess. In Clay the thrashers show a variation in the yield from 8 to 27 bushels per acre, and in Wells the range is from 3 to 40 bushels, one field of 25 acres, underdrained, yielding 37 bushels per acre.

Returns representing the larger portion of the crop of Illinois indicate a decrease from last year of 2 per cent. Madison and Saint Clair, together producing nearly three millions of bushels, claim an increase of 10 per cent.; DeKalb, Crawford, and Stephenson make a similar gain; Ogle returns 115, and Madison 110, while Adams, sometimes yielding almost a million bushels, falls 40 per cent. from the aggregate of last year. Sangamon returns 80; Macoupin, 80; Morgan, 75; Bureau, 75; Hancock, 70; while Lee, Winnebago, Hendrickson, among the large producers, report 100.

An increase of 21 per cent. is indicated in Wisconsin over the crop of last year, which was not a large one.

The increase in Minnesota, in counties which produce more than half the crop, is 28 per cent.; in Goodhue county, which yielded 1,815,603 bushels in 1869, the increase on last year is placed at 33 per cent.; in Winona, a county of almost equal importance, 10 per cent.; in Mower 100 per cent. increase. These three counties grew one-fifth of the crop of the State in 1869.

Returns are received from fifty-four counties in Iowa, which produced about nineteen millions of bushels in 1869, which indicate an increase

of 12 per cent. over the crop of last year. Clayton, yielding in the census-year a million bushels, returns 150, and Black Hawk, a still larger producer, reports 90. Only eight counties report decreased production.

The crop in Missouri is very short, promising only 60 per cent. of the last year's product. Nearly every wheat-growing county returns a decreased yield—Franklin, 95; Saint Louis, 70; Howard, 60; Johnson, 50; Lincoln, 40; and some as low as 20 and even 10. This comparative failure was caused by winter-killing, aided by the fly and chinch-bug.

The returns from Kansas are less favorable than for several years. The spring-reports of condition were very low, and the chinch-bug has been unusually destructive. After taking into account the increased breadth from extension of settlement, the crop appears to be one-fifth less than that of last year. Bourbon reports nearly a failure; Osage, one-tenth of a crop; Franklin, one-fifth. Marshall reports 15 per cent. more than last year; Butler 25 per cent. increase; and Shawnee, 50. The variation in other counties is almost equally marked. Wheat is scarce, and prices are high.

The enlargement of area in Nebraska will give an increase, as indicated by the counties reported, of 40 per cent.

The crop of California is unprecedented. The increase upon last year's product is estimated at 75 per cent., which will bring the aggregate number of bushels almost up to thirty millions. The yield is large, the area much increased, and the quality of the grain is generally excellent. Monster farms are found in the Sacramento, San Joaquin, and other valleys, one being reported in the San Joaquin of 36,000 acres, another of 23,000, and a third of 17,000. Individual operators are numerous who have from 50,000 up to 1,000,000 bushels of wheat to sell. A great difficulty is experienced in freighting, storing, and shipping the surplus, which undoubtedly exceeds 20,000,000 bushels. Unless owners combine to provide warehousing facilities in the interior, great loss must ensue in the coming rainy season, as it can neither be transported to nor stored in San Francisco before the rains come. In July, August, and September seventy-eight cargoes were shipped to Great Britain, and the shipments of the coming months will only be limited by the number of vessels to be loaded.

The crop of Oregon is an average one, and the quality good.

These figures indicate an increase of about 5 per cent. upon the crop of last year, and promise an estimate, when returns are more fully analyzed, of at least 240,000,000 bushels, against 230,000,000 bushels last year. This result is assured even after a reduction of 35 per cent. is admitted upon the crop of the Middle States and Maryland, which appears to have fallen from 37,000,000 bushels to 24,000,000. An interesting aspect of this season's cropping is the apparent enlargement of the aggregate of the Southern States from 18,000,000 to 27,000,000 of bushels, mainly in Tennessee, Texas, and North Carolina. West of the Mississippi, according to present information, there has been an increase of 15,000,000—say from 70,000,000 to 85,000,000. The central line of wheat production, running north and south, is this year farther west than ever before, and is nearly identical with the ninetieth meridian, which divides centrally the States of Wisconsin and Illinois. Nearly all the wheat produced between this line and the Mississippi River is grown in the western half of Wisconsin and of Illinois. Ere long the quantity grown west of the Mississippi must equal that produced east of it.

MAINE.—*Oxford*: Good; harvested and secured in good condition. *Piscataquis*: Better quality than last year. *Androscoggin*: Very good. *Sagadahoc*: Remarkably good.



MASSACHUSETTS.—*Berkshire*: Acreage small, but the yield would have been excellent but for the storms of August.

RHODE ISLAND.—*Kent*: Spring-wheat from the Department yields a superior crop.

PENNSYLVANIA.—*Washington*: Winter-wheat all got in early, and is needing rain very much; the old crop sells at \$1.60 to \$1.75 per bushel. *Montgomery*: Wheat in the ground is very promising. *Juniata*: Fultz wheat yielded from 15 to 30 bushels per acre of good quality. It ripens early, and the earlier yielded best. It stood the winter better than it did the late rains. Its culture is increasing. *Lancaster*: Wheat as good as formerly, both in straw and grain. Mr. Jacob L. Minnish, near Ephrata, raised 23 bushels of Fultz wheat to the acre. *Lebanon*: Fultz wheat satisfactory; fall-grain increased 25 per cent. in acreage. *Bucks*: Yields finely as to straw, and is of superior quality. *Beaver*: Yield better than was anticipated. *Butler*: Fultz wheat supplies a great desideratum; its advantages embrace late sowing, early ripening, fair-sized grain, and large yield. *Armstrong*: Quality good in spite of injuries in the shock reducing the condition 5 per cent. *Lawrence*: Showery weather delayed seeding in the first part of September.

MARYLAND.—*Montgomery*: Better yield than was estimated, some farmers getting from 20 to 25 bushels per acre. *Carroll*: Early-sown wheat a failure; late-sown turning out very well. *Howard*: Straw small, but grain-yield surprisingly heavy. *Caroline*: Old wheat held up for high prices; generally sown broadcast, and on corn-land.

VIRGINIA.—*Pulaski*: Injured in the shock by continual rains; much of the crop threshed in a damp state. *Fluvanna*: Average. *Henrico*: Twenty-five per cent. better than last year. *Prince George*: Third of a crop. *Rappahannock*: Quality never better. *New Kent*: Nearly all the wheat of the county grown on two or three large farms. *Essex*: Wheat would have been 25 per cent. above average in spite of drought but for a destructive hail-storm in June; high prices are stimulating this crop. *Highland*: Very fine in some localities; a failure in others. *Clarke*: Not over a half crop; would have been much lower but for extra yields in the Shenandoah Valley; one river-bottom of 24 acres averaged 39.4 bushels per acre of Lancaster wheat, which was not expected to do much; Fultz did well. *Montgomery*: Sowing delayed, and average reduced by drought. *Prince Edward*: Superior in quality to last year's crop and two-tenths larger. *Madison*: Crop better than for many years; quality superior, especially Fultz wheat.

NORTH CAROLINA.—*Forsyth*: Very fine; price \$1.25 to \$1.35 per bushel. *Harnett*: Injured 10 per cent. by smut. *Alamance*: Above average. *Warren*: Relatively large increase due to the fact that last year's crop was measurably a failure. *Stanly*: Yield abundant; quality fine; Tappahannock and Early Red especially good, better than for several years.

GEORGIA.—*Guinnett*: Crop 50 per cent. better in quantity and quality than last year.

TEXAS.—*Ellis*: An increased area sown; old crop selling at \$1 per bushel. *Bexar*: Average yield 22½ bushels per acre. *Upshur*: Crop improved. *Lamar*: Crop 150 per cent. larger than last year; no old wheat on hand.

TENNESSEE.—*Giles*: Greatly injured in the shock. *Loudon*: Seeding delayed by drought. *Madison*: Poorly harvested and secured. *Monroe*: Drought has retarded seeding. *Lincoln*: Double the crop of 1871 and the heaviest ever made in the county; quality excellent. *Greene*: An unusual amount of wheat going to market; price ranging from \$1.15 to \$1.30 for white, mostly Tappahannock variety. *Fentress*: Above average in quantity and quality. *Humphreys*: Damaged by rain in the shock full 30 per cent; yield 50 per cent. greater than last year; very little old wheat. *Knox*: Farmers behind-hand in seeding; more pains taken in preparing the ground and in selecting seed. *Hancock*: Very good. *Wilson*: Crop exceeds last year's 20 per cent. in quantity and 25 per cent. in quality.

WEST VIRGINIA.—*Jefferson*: No old wheat left; new crop in the ground. *Mineral*: Extra quality. *Kanawha*: Extra good; grain, plump, large, and unusually heavy. *Lewis*: An extra crop put in; weather favorable for seeding. *Monongalia*: Yield one-fourth short, and crop injured in the shock by wet. Wheat brings \$1.50 per bushel. *Monroe*: Largest crop in ten years; quality excellent.

KENTUCKY.—*Shelby*: Average yield, 16 bushels against 5½ last year; quality improved 20 per cent. *Nicholas*: Fultz wheat did very well. *Mercer*: Acreage increased 25 per cent. *Clinton*: Larger and better than usual. *Lincoln*: Best crop ever raised; a portion injured by wet. *Livingston*: Very little wheat sown.

OHIO.—*Logan*: Wheat thin on the ground, but the quality excellent. *Defiance*: New crop growing finely. *Noble*: Almost a failure. *Medina*: Beyond expectation; a full average. *Crawford*: Wheat but half a crop, but 20 per cent. better than last year. *Hancock*: The highest yield is 46 bushels per acre. *Portage*: Crop short, but fine. *Vinton*: Too dry for seeding. *Lucas*: Increased acreage sown; coming up finely.

MICHIGAN.—*Cass*: Acreage of winter-wheat largely increased, and new crop sown in remarkably good condition. *Van Buren*: No killing frost; plenty of rain for the past week. *Calhoun*: Average. *Kent*: Crop short, but of excellent quality. *Montcalm*:

Wheat sown from 1st to 15th September; looks better than for five years at this date *Shiawance*: Crop got in in good season.

INDIANA.—*Owen*: Smaller acreage, but yield equal to last year's; quality depreciated by rains after harvest. *Madison*: Good; an increased acreage sown. *Randolph*: Fultz yielded 2 bushels from 4 quarts of seed; very good yield, considering the drought. *Crawford*: No plowing for wheat till the last week of September. *Whitley*: First killing frost last evening. *Daviess*: Best crop in twenty years. *Kosciusko*: Generally shrunk by hot weather, the straw not being sufficiently ripe to fill the grain. *Jennings*: Very little sown; chinch-bugs at work. *Parke*: Ground in better order and better prepared than usual for seeding; early-sown wheat looks fine. *Pike*: Seeding delayed by drought; usual acreage will be sown. *Hamilton*: Young wheat coming up finely. *Franklin*: Seasonable rains favored seeding; crop starting finely. *Clay*: Threshing out better than was expected; fields averaging from 8 to 27½ bushels per acre; quality reduced in the shock by rains. *Wells*: Remarkably wide range in crops, from 3 to 40 bushels per acre; a field of 25 acres, well underdrained, yielded 37 bushels per acre; the grain was injured in the shock by wet. *Posey*: Averages 25 bushels per acre, and sells at \$1.50 to \$1.60 per bushel.

ILLINOIS.—*DeKalb*: Wheat, spring and winter, superior in quality; larger breadth sown than for many years; winter-wheat more reliable than spring-wheat. *Marion*: Seeding retarded by drought; acreage reduced 20 per cent. in consequence. *Kankakee*: Spring-wheat but little sown through fear of the chinch-bug; the small acreage of winter-wheat averaged 20 bushels per acre. *Crawford*: Damaged in the shock by wet. *Macoupin*: About the usual area of winter-wheat sown; none broad-cast. *Saint Clair*: Fall seeding in good order. *Bureau*: Culture decreasing; crop good. *Peoria*: Wheat-culture increasing. *Cumberland*: Increased acreage sown. *Hancock*: Acreage increased a third. *Ogle*: But little old wheat; yield better than last year. *Boone*: Spring-wheat in some cases destroyed by chinch-bugs.

WISCONSIN.—*Pierce*: Damp weather injured the wheat after harvest. *Waukesha*: Heaviest wheat raised since 1860, nearly all over 60 pounds per bushel, the standard being 58. *Iowa*: Great variety in local crops; timber-land averages 20 bushels per acre; prairie, not over 10 or 12; bottom, about 7. *Sheboygan*: Injured by rot. *Green Lake*: Yield very unequal on account of the unequal distribution of rain. *Saint Croix*: Greatly injured in the stack by rain and heat.

MINNESOTA.—*Goodhue*: Marked improvement in the yield of spring-wheat. *Houston*: Will average 18 bushels per acre. *Le Sueur*: Damaged 10 per cent. in shock by wet. *Ramsay*: Injured somewhat by damp. *Sherburne*: Unequaled since 1859. *Brown*: Kernel shrunk. *Waterman*: Average yield from 18 to 32 bushels per acre, but quality below last year's. *Mower*: A very large proportion of the crop badly damaged by wet. *Kandiyohi*: Yield of wheat double what it was last year; quality equally good.

IOWA.—*Cedar*: Crop damaged 5 per cent. by excessive rains. *Story*: Injured by storms. *Montgomery*: Averages 22½ bushels per acre; price, 85 cents per bushel. *Allamakee*: High prices caused the farmers to sell out their old wheat. *Harrison*: Injured by falling and spot. *Black Hawk*: Injured by extreme heat before harvest. *Johnson*: Crop above average. *Muscatine*: Good in quantity and quality. *Buena Vista*: Partly injured in the shock by wet. *Cass*: Acreage 50 per cent. greater than last year; average yield 25 per cent. greater. *Marshall*: Will average 16 to 18 bushels. *Howard*: Early-sown wheat fared better than any other small grain. *Lucas*: Plowing retarded by drought. *Cherokee*: Averaged from 5 to 30 bushels per acre. *Ray*: The large percentage of the crop is due to the low average of last year. *Mitchell*: Injured in the stack by wet.

MISSOURI.—*Crawford*: Crop greatly injured by chinch-bugs. *Polk*: Injured by chinch-bugs. *Jasper*: Mostly seeded three weeks earlier than last year. *Ozark*: Abundant, and of superior quality. *Boone*: Wheat acreage 35 per cent. below average. *Platte*: Not enough raised to supply home-demand. *Cedar*: Large area sown, with flattering prospects. *Clay*: Not enough raised for seed. *Harrison*: Newly-sown wheat doing well. *Holt*: None but spring wheat raised; crop good; somewhat sprouted in the stack. *Reynolds*: Injured somewhat by chinch-bug. *Saint Clair*: Very poor. *Saint Louis*: Drought has retarded plowing for fall-seeding. *Ralls*: But little choice wheat in the new crop; generally damaged either by severe winter, by fly in the spring, or by chinch-bugs. *Nodaway*: The late crop represented an increased acreage and a growth superior to last year's. *Newton*: Kernel excellent; winter kills Walker wheat less than any other variety; very little, if any, old wheat on hand. *Howard*: Large crop sown; mostly drilled. *Franklin*: Drought caused late seeding. *Taney*: Contrary to expectation, the wheat-crop threshes out better than for seven years, averaging 15 bushels per acre.

KANSAS.—*Morris*: Large breadth of wheat sown. *Nemaha*: Increased acreage of winter-wheat sown; the millers have loaned much seed to farmers to increase the crop. *Beaubien*: Increased acreage sown; seed scarce. *Cherokee*: Good prices have encouraged an increased sowing of wheat, which is generally drilled; market-price, \$1.55 per bushel; army-worm has done it some damage, especially on stubble-ground. *Riley*:



Very little winter-wheat; spring-wheat light and poor. *Linn*: Wheat-crop badly injured by chinch-bugs. *Jackson*: Broad area seeded; young crop springing finely. *Coffey*: Season fine for seeding. *Dickinson*: Large breadth sown; ground in excellent condition; young wheat looks splendid. *Miami*: Wheat-sowing lively; broad acreage sown.

NEBRASKA.—*Nemaha*: Threshed out better than was anticipated; spring-wheat generally good, but winter-wheat too often mixed with other grain. *Washington*: Very propitious season; crop averages from 20 to 40 bushels of excellent quality. *Boone*: Exceeds expectations.

CALIFORNIA.—*Plumas*: Crop good, but the grain not so plump as was expected. *Santa Clara*: Not more than half the crop thrashed; great demand for farming land on shares; most of the good wheat held up by farmers for better prices; good milling wheat brings \$1.67 to \$1.70 per cental; good shipping, \$1.62 to \$1.65. *Alameda*: Mostly thrashed; yield better than was expected before the harvest; prices falling, through lack of transportation to market. *Stanislaus*: Wheat-crop habitually overestimated by the farmers. *Contra Costa*: Crop quadrupled; some of it shrunk and foul through negligent treatment. *Buena Vista*: Yield better than was expected. *San Joaquin*: Yield 60 per cent. greater than last year, indicating that a wet season is better than a dry one. *Sonoma*: Grain-crops failed on account of excessive rain in winter; increased amount of wheat held over from last year. *Placer*: Full average.

OREGON.—*Lane*: Last year 95 cents per bushel; this year, from 55 to 60 cents. *Grant*: Grain good, but yield reduced. *Washington*: Wheat 65 cents a bushel; last year, \$1.25. *Columbia*: Fall-wheat thrashed out better than was expected. *Douglas*: Final product, after thrashing, surprisingly large; condition superior.

DAKOTA.—*Bon Homme*: Superior quality.

UTAH.—*Davis*: Heavy yield; excellent quality; low prices.

The returns of October relate to the condition of the corn-crop, without reference to area or aggregate product. Unusual uniformity appears, only five States falling below average, viz: Delaware, 90; Maryland, 97; Virginia, 92; Florida, 86; and Arkansas, 91. Rhode Island is placed at 100, and every one of the others are above 100, viz: Maine, 108; New Hampshire, 110; Vermont, 113; Massachusetts, 102; Connecticut, 111; New York, 106; New Jersey, 110; Pennsylvania, 107; North Carolina, 110; South Carolina, 103; Georgia, 105; Alabama, 106; Mississippi, 112; Louisiana, 124; Texas, 121; Tennessee, 101; West Virginia, 105; Kentucky, 112; Ohio, 110; Michigan, 104; Indiana, 110; Illinois, 110; Wisconsin, 105; Minnesota, 103; Iowa, 107; Missouri, 107; Kansas, 112; Nebraska, 104; California, 104; Oregon, 103. The average for all the States is 108. This promises one of the largest corn-crops ever produced. The November returns will give the aggregate product upon the total area.

## CORN.

MAINE.—*York*: Ripening rapidly. *Cumberland*: Corn-fodder depreciated 20 per cent. by bad weather. *Piscataquis*: Better than for several years. *Oxford*: Best crop in ten years. *Androscoggin*: Very fine. *Waldo*: Very fine.

VERMONT.—*Addison*: Fine, through abundant rains.

MASSACHUSETTS.—*Norfolk*: Very good; ripened well; but slight frosts in the lowlands, which have not affected the crop.

CONNECTICUT.—*New London*: Will average much better than last year, though somewhat injured by heavy rains.

NEW YORK.—*Ulster*: Has had a fine season; wet and hot. *Steuben*: Improved by late rains. *Genesee*: Fair growth of stalks, but a limited growth of ears on account of drought; in some low places the crop is splendid. *Lewis*: Very promising. *Wyoming*: Yield not large, but well matured. *Sullivan*: Never better.

NEW JERSEY.—*Sussex*: Crop seldom, if ever, better. *Gloucester*: Crop unprecedented and out of danger.

PENNSYLVANIA.—*Franklin*: Crop excellent; some fields in the southern part of the county cannot be excelled in the country; yield will be large and of fine quality. *Washington*: Damaged by being blown down. *Montgomery*: Crop both in quantity and quality exceeds any for years. *Lancaster*: Better than for many years. *Armstrong*: Very good and large; mostly saved. *Westmoreland*: A heavy frost (October 1) will cause much soft corn.

MARYLAND.—*Baltimore*: Crop will be full average on well-cultivated fields; culture

in the county generally good, and hence the crop is better than was expected. *Carroll*: Good in the northern, and very good in the southern part of the county, where the drought was most severe. *Montgomery*: Better than was anticipated during the dry summer; deep plowing and fertilizers to some extent counteracted the drought. *Howard*: Crop crippled by cut-worms. *Washington*: Finer than ever along the Pennsylvania line, but short farther south. *Caroline*: Turned out well; 60 bushels per acre; corn-fodder a substitute for hay in many cases. *Anne Arundel*: Good.

VIRGINIA.—Never better; out of danger from frost. *Fluvanna*: Very poor on forest-lands. *Stafford*: Much injured by drought. *Rappahannock*: Crop 25 per cent. above average in spite of drought. *Orange*: Nearly average in spite of drought. *Prince George*: Late-planted corn very much improved; early-planted mostly a failure. *Henrico*: Very short. *Clarke*: Very good in the southern third of the county, but elsewhere below average. *Highland*: Best crop known for many years, in spite of an unfavorable spring and summer. *Chesterfield*: Nearly all secured. *Princess Anne*: Seriously injured by drought. *Essex*: Severely injured by drought. *Lancaster*: Injured by drought. *Madison*: Early corn good; late injured by drought.

NORTH CAROLINA.—*Forsyth*: Very good; price, 65 and 70 cents per bushel. *Gaston*: Promises a very large crop. *Harnett*: Very promising; season favorable. *Franklin*: Escaped the drought. *Rowan*: Injured 10 per cent. by a violent storm on September 8. *Haywood*: Pennsylvania corn has done finely, showing a special adaptation to our climate. *Currituck*: Very fine and well matured. *Darrie*: Shortened 10 per cent. by drought. *Alamance*: Above average. *Sampson*: Crop excellent and well saved. *Stanly*: Crop average; bottom-crop, fine; white Roanoke the favorite variety.

SOUTH CAROLINA.—*Orangeburgh*: Very good. *Clarendon*: Below average; less than last year. *Union*: Crop good; dry enough to crib. *Edgefield*: Crop large and in fine condition.

GEORGIA.—*Dooly*: Late crop injured by drought. *Forsyth*: Generally good; on upland about 15 per cent. above average. *Muscogee*: Fair in some localities; poor in others. *Lee*: Better than was expected. *Sumter*: Better than last year, but below average. *Worth*: Better than in 10 years. *Columbia*: Remarkably fine. *Heard*: Better than for several years. *Butts*: Shortened by drought. *Whitfield*: Crop well-matured and larger than was expected. *Twiggs*: Looks well; never of better quality than now.

FLORIDA.—*Jackson*: Only half a crop; not so good as last year. *Orange*: Shortened 40 per cent. by drought. *Jefferson*: Not over two-thirds of an average. *Taylor*: Crop short near the coast; not over 30 or 35 bushels per acre; 20 per cent. better in the northwest part of the county. *Lery*: Injured by drought in May and June; not more than half enough to supply the home demand.

ALABAMA.—*Saint Clair*: Destructive floods in July prevented the finest crop ever made in the county; upland corn good. *Clarke*: Crop light in some places; average in others. *Dallas*: Above average in quantity and quality. *Lee*: Crop much the best since the war. *Blount*: Excessive rains destroyed about half the crop. *Lawrence*: Early corn good; late crop poor. *Chambers*: Ten per cent. above average. *Macon*: Good; enough for home demand. *Limestone*: Better than for several years.

MISSISSIPPI.—*Rankin*: Yellow corn from the Department a success; stalks fine; ears of good size; ripens early. *Tishomingo*: Extra fine; late planting somewhat injured. *Grenada*: Best and largest crop since the war; full average. *Jasper*: Early crop very good; late plantings injured by drought. *Amite*: Made before the drought set in. *Smith*: Full average and of good quality. *Lee*: Made before the drought; a good yield. *Lauderdale*: Crop 25 per cent. above average, but not sufficient to meet home demand; 25 per cent. more must be imported. *Hinds*: Full average. *Jefferson*: Early-planted crop good; out of the way of drought. *Kemper*: More abundant than last year; probably enough for home demand. *Attala*: Good; mostly made before the drought.

LOUISIANA.—*Morehouse*: Extra fine. *La Fourche*: Heavier ears but fewer than last year. *Red River*: Bottom-corn full 50 per cent. better than hill-corn. *Assumption*: Largest crop since the war.

TEXAS.—*Coryell*: Yield fine; average 40 bushels per acre, some farms reaching 75; market price 40 cents. *Smith*: Abundant. *Red River*: Pretty well matured before drought set in. *Medina*: Crop made before the drought set in. *Rusk*: Early-planted bottom-corn doing well. *Upshur*: Better than last year. *Austin*: Very good generally. *Grayson*: Best crop in 10 years; 40 to 60 bushels per acre. *Matagorda*: Shortened by drought.

ARKANSAS.—*Craighead*: A large proportion late, and quite a failure. *Drew*: Mostly gathered; matured before the drought; crop extra, both in quantity and quality. *Jackson*: Greatly shortened by drought; injured seriously by an immense number of squirrels. *Columbia*: Estimates greatly declined since the crop was gathered; nearly all hoosed. *Sebastian*: Shortened a third by drought, but of excellent quality; early-planted corn has done well, but late-planted amounts to nothing.



*Independence*: Impaired by drought; late corn a failure. *Woodruff*: Early corn fair; later crops a failure.

**TENNESSEE.**—*Dickson*: Prospect less hopeful than in September, on account of drought. *Bradley*: Excellent, but slightly injured by drought. *Smith*: Average in spite of drought. *Monroe*: Late corn injured by drought. *Truesdale*: Late corn injured by drought. *Fentress*: One-fourth above average; new corn sells at 25 cents per bushel. *Humphreys*: Late corn damaged by drought. *Gibson*: Late corn shortened by drought. *Jefferson*: Much better than last year. *Hancock*: Very good. *Wilson*: Ten per cent. above average. *Grainger*: Nearly ruined by drought. *Morgan*: Yield less than was expected. *Hardin*: Late crop injured by drought.

**WEST VIRGINIA.**—*Braxton*: Crop good. *Jefferson*: Crop well matured. *Mineral*: Abundant yield; saved before frost. *Wayne*: Crop beyond expectation. *Jackson*: Never better.

**KENTUCKY.**—*Shelby*: Early corn matured before the drought set in; late plantings greatly shortened. *Daviess*: Crop will reach 1,250,000 to 1,500,000 bushels. *Clinton*: Excellent. *Adair*: Well matured. *Carroll*: Drought in August and September reduced a very large crop to average.

**OHIO.**—*Logan*: The best crop for many years. *Defiance*: Crop made. *Hardin*: Brought out finely by late rains. *Franklin*: Never so good or so large in acreage. *Crawford*: Excellent. *Delaware*: Crop 25 per cent. more than any former yield. *Madison*: Never better; hot summer has finely brought out corn; crop large and well matured.

**MICHIGAN.**—*Cass*: Cut-worms, grub-worms and drought have injured some fine yields of corn. *Jackson*: Yield very large in fields not affected by the worm in the spring. *Emmett*: Harvested in good condition.

**INDIANA.**—*Owen*: Never before ripened so well; crop fuller and better ripened than for forty years. *Crawford*: Drought will bring a superior corn-crop down to an average. *Whitley*: Well ripened. *Jennings*: Shortened by chinch-bugs. *Laporte*: Injured by drought on sandy land; late rains saved prairie-crops; white-grub injured some fields. *Noble*: Good, except the replanted, which is injured by the grub. *Martin*: Materially shortened by drought in July and August. *Lawrence*: Two months' drought have reduced the yield, yet it will be average. *Hamilton*: Fine crop, well matured. *Franklin*: Nearly safe from frost. *Gibson*: Early-planted very good; never better; late plantings injured by drought.

**ILLINOIS.**—*DeKalb*: Injured by rain and winds, but the dry fall enables it to recover and, perhaps, to make an average crop in both quantity and quality. *Marion*: Shortened by drought. *Alexander*: Most of the crop was early planted and is good; one-tenth late planted and short. *Carroll*: Market-price, 23 cents per bushel. *Franklin*: Shortened by drought. *Maconpin*: Very abundant. *Bureau*: Exceedingly large, excellent and out of danger. *Morgan*: Season very fine for corn. *Lee*: Out of the way of frost. *Putnam*: Crop heavy and well matured, but very much thrown down by winds and rains. *Winnebago*: Well matured before frost came. *Massac*: Late corn injured by drought. *Ogle*: Very good. *Tazewell*: Largest crop ever raised. *Marshall*: Crop enormous; could not be better. *Douglass*: Will scarce pay for harvesting on account of low prices. *Mason*: Good in spite of chinch-bugs. *Stephenson*: Abundant and fine; out of the way of frost. *Boone*: Very good.

**WISCONSIN.**—*Clark*: Gathered in good order. *Pierce*: Splendid condition. *Sheboygan*: Good, but less yield than was expected. *Green Lake*: Good. *La Fayette*: Fine; season propitious. *Saint Croix*: The hot weather of August and September brought forward the crop, making it the earliest and best yet raised in the county.

**MINNESOTA.**—*Blue Earth*: Crop out of the way of frost. *Goodhue*: Crop better than was expected. *Houston*: Out of the way of frost. *Sherburne*: Very fine and out of the way of frost.

**IOWA.**—*Cedar*: Yield excellent, inducing farmers to feed an extra number of stock. *Story*: Large crop in spite of storms, with not enough hogs to eat it. *Clinton*: Out of the way of frost. *Montgomery*: Fully matured; averages 50 bushels per acre, and brings from 12½ to 20 cents per bushel. *Des Moines*: Late, and damaged by frost. *Johnson*: Average. *Linn*: Injured by the late severe storm; damaged 10 per cent. *Black Hawk*: Best crop ever known. *Muscatine*: Nearly all safe; crop average, though injured by grub-worm. *Mahaska*: Grub-worm cut down the crop 10 per cent. *Cass*: Crop enormous; never better; out of the way of frost; will average 60 bushels per acre. *Floyd*: Crop excellent. *Marshall*: Ripe and heavily-eared. *Howard*: Crop promising, under the fair growing conditions of July and August, and the delay of frost in September. *Cherokee*: Much better than usual; will average 50 bushels per acre. *Henry*: Nearly all safe from frost. *Polk*: Well matured; nearly ready to crib. *Mitchell*: Never finer.

**MISSOURI.**—*Audrian*: Planted late, but will reach full average if the frost delays a little longer. *Cass*: Fine where the ground was not too wet in plowing-time. *Jasper*: Late corn badly injured by chinch-bugs. *Ozark*: Promising. *Shelby*: Better than usual, though injured by rains. *Platte*: Largest yield for many years, but injured by

a severe storm. *Clay*: Well matured; crop heavy and safe. *Darvess*: Planted late and still quite green; injured slightly by one frost. *Holt*: This is the second of two splendid corn-years; never a failure here. *Reynolds*: Injured by high winds and by chinch-bugs. *Scott*: Early corn a little below average; late almost a failure. *Saint Louis*: crop average; matured early. *Ralls*: Yield large, but not so large as was expected. *Putnam*: Corn 15 cents per bushel. *Phelps*: Greatly damaged by chinch-bug. *Newton*: Full average and in good condition. *Iron*: Injured by drought and chinch-bugs. *Pettis*: Late corn injured by frost.

KANSAS.—*Douglass*: Never better; selling at 20 cents per bushel. *Lincoln*: Corn No. 1. *Nemaha*: Large surplus. *Linn*: Injured by chinch-bugs. *Labette*: Injured 10 per cent. by chinch-bugs.

NEBRASKA.—*Thayer*: Splendid till the grasshoppers appeared. *L'Eau-qui-Court*: Squaw-corn the best planted in the county; ripens too early for grasshoppers, and gives the largest yield per acre. *Nemaha*: Crop saved from frost. *Gage*: Not so good as was expected.

CALIFORNIA.—*Sonoma*: Crop excellent; full 10 per cent. above average.

OREGON.—*Douglass*: Less affected by drought than any other crop; crop unexpectedly large.

ARIZONA.—*Yuma*: Fine.

UTAH.—*San Pete*: Injured by frost, which came three weeks earlier than usual. *Iron*: Injured by frost.

DAKOTA.—*Bon Homme*: Grasshoppers injured the crop, yet the yield will be very large.

COLORADO.—*El Paso*: Damaged by frost.

## COTTON.

The cotton prospect has undergone no serious changes since the September report. The weather has been generally favorable for picking. No violent storms are reported, and drought has not prevailed; the rainfall in nearly all the cotton States exceeding two inches in September, Florida alone reporting fully four inches, and Tennessee three. The devastations of the caterpillar have extended farther north, even into North Carolina, and have involved the top crop partially, and in many places wholly. The influence of drought in the later summer months has been cumulative in its effects, and exhausted vitality is more apparent than in September; yet there are districts which report exemption from this premature decay, and promise enhanced results. The effect of fertilizers in advancing the crop in the Atlantic States, and the continued effects of worms and drought in shortening the season of growth, will greatly hasten the close of picking. In some places the crop is already gathered, and in many others the fields will be clean early in November.

The general average of condition is reduced from 91 in the first week of September to 82 in October. In October of last year the average was 76, which was a material reduction from that of the previous month. It will be seen that that condition is placed still higher than in last year's report for October, while the area, according to our June returns, was 13 per cent. greater. The State averages are as follows: Virginia, 87; North Carolina, 90; South Carolina, 86; Florida, 75; Georgia, 88; Alabama, 82; Mississippi, 78; Louisiana, 72; Texas, 85; Arkansas, 75; Tennessee, 90.

The local disparity existing in condition of cotton is perhaps more marked than usual. Of the two counties in Alabama producing most largely, both together yielding one-ninth of the cotton in the State, Montgomery reports 100 and Dallas 50. In Georgia, Dawson County, the first in amount of production, returns 100, while Sumter and Lee Counties, both large producers, give only 66. In Mississippi few prominent counties report high condition: Washington, 66; Madison, 66; Warren, 65; and Hinds, 60; while Noxubee and Claiborne return 100.



### A few extracts from correspondence are made :

**NORTH CAROLINA.**—*Blight or rust* very general, causing middle and top crops to shed; bolls generally small. *Wake*: Drought, rust, and caterpillars have cut down the crop 25 per cent. below average. *Edgecombe*: Reduced 20 per cent. during September by drought and insects. *Sampson*: Rust and caterpillars will cut down the crop one-fifth. *Hertford*: Drought has caused cotton to shed its leaves, and to open prematurely; picking going forward rapidly and will soon be completed; yield below average in lint, but the increased acreage will bring the aggregate up to last year's.

**SOUTH CAROLINA.**—*Orangeburgh*: About average. *Clarendon*: Yielding 15 per cent. less than last year; small increase in acreage, but will not raise the yield to average; two-thirds already gathered. *Barnwell*: Crop 15 per cent. greater than last year; nearly all open. *Fairfield*: Shortened 10 per cent. by unfavorable weather. *Union*: Yield above average on good land well cultivated; poor on badly-cultivated land. *Newberry*: Shortened by drought; little over half crop; rust has injured the plant, causing the bolls to open prematurely. *Lerington*: A fourth below average, but in good condition and early gathered. *Edgefield*: Late crop largely burned up; prevailing opinion reduces the estimate too low.

**FLORIDA.**—*Jackson*: Caterpillar, boll-worm, and drought have seriously injured the crop. *Suwannee*: Greatly injured by caterpillars. *Orange*: Badly injured of late by the caterpillar. *Gadsden*: Ravages of caterpillars have stopped all further fruiting, cutting the crop down 50 per cent. below average. The rapid opening of the bolls has required an equally rapid picking. Ginning and packing press more closely upon the picking than for forty years previous, on account of the pressure of pecuniary obligations of the planters, and through fear of a sudden collapse of prices. *Jefferson*: Greatly injured by caterpillars; crop will probably be housed by the middle of October. *Columbia*: Injured by rust and caterpillars 75 per cent.; open. *Clay*: Shortened a third by caterpillars, yet full average. *Alachua*: Reduced a half by caterpillars. *Lery*: Seriously injured by caterpillars, rust, &c., but nearly double the yield anticipated in August. Good weather for picking, crop being gathered in good condition; quality better than usual, owing to improvement in seed.

**GEORGIA.**—*Dooley*: Crop shortened a fourth by drought and caterpillars; dry weather will mature it a month earlier than usual. *North*: Crop the most promising since the war, but suffering seriously from caterpillars. *Sumter*: Opening earlier and more rapidly than in any year since 1859; top crop on stiff lands almost destroyed by caterpillars. *Lee*: Crop between a half and two-thirds; caterpillars destroying the late-planted, of which the proportion is unusually large; three-fourths of the cotton now open. *Muscogee*: Injured by drought and worms; many bolls small; though they should all open, the yield of lint will be light. *Forsyth*: Never better; promises a good yield. *Cathoun*: Half destroyed by caterpillars. *Columbia*: Seriously injured by drought, rust, worms, &c. *Richmond*: Opening rapidly; late plantings cut off by rust; weed larger, but fruit smaller than usual. *Wilkinson*: Caterpillars, rust, and drought have greatly cut down the crop; nearly two-thirds of it already picked. *Schley*: Shortened by caterpillars and rust. *Marion*: Crop has fallen off 30 per cent. since August 1. *Heard*: Not over half a crop; injured by caterpillars. *Floyd*: Shortened by drought and caterpillars. *Guinnett*: Heavy rains, followed by drought, have caused cotton to shed and the prospect to decline 30 per cent. from the August report. *Clayton*: Crop prospects declined to an average; it is half open, and is being rapidly marketed to meet pecuniary obligations for fertilizers, provisions, &c. *Upson*: Seriously injured by two months' drought and caterpillars. *Chattahoochee*: Injured by drought and caterpillars. *Butts*: Cut down by rust, which appeared about September 3; shortened about a fourth. *Clay*: Shortened by caterpillars; stripped by September 1. *Macon*: Bottom and middle cotton a full average; top crop a total failure; top is about 27 per cent. of the whole. *Chattooga*: Acreage increased, but crop injured by caterpillars and boll-worms so that a good fall season will be requisite to make the yield equal to last year's. *Coweta*: Opening fast; many fields nearly picked. *Madison*: Good average, owing to liberal use of fertilizers. *Putnam*: Reduced 15 per cent. below average since last report. *Wilkes*: Fast shedding leaves and opening bolls prematurely; early gathered and marketed. *Whitfield*: Yield greater than was anticipated, though injured by insects. *Decatur*: Largely destroyed by caterpillars; crop all picked. *Twiggs*: Greatly damaged by drought and caterpillars; three-fourths of the crop open; all will be picked in October. *Fayette*: Picking going on rapidly; crop being placed in the market promptly. *Pike*: Drought has shortened the crop. *Effingham*: Season fine for picking.

**ALABAMA.**—*Saint Clair*: Worms injured the crop. *Hale*: August 1 the crop was exceedingly promising; August 20 it was swept by caterpillars; not a boll has been made since that date. *Butler*: Destroyed by worms; not a leaf left; will make about half a crop. *Clarke*: Caterpillars, after August 15, destroyed all the leaves, forms, and small bolls; what remained of the cotton opened all at once, necessitating considerable loss in gathering. *Dallas*: Half crop; fine weather for picking; quality superior. *Lee*: Cannot exceed five-eighths of an average; droughts and insects very injurious. *Montgomery*: Greatly cut down by the caterpillar. *Colbert*: An unusual proportion of the crop now open; bad weather and worms have injured it; yield,

however, larger than was anticipated, but will not class so high as last year. *Blount*: Reduced to average by caterpillars which have devoured the leaves; late bolls may not mature, in which case the condition will be still further reduced. *Chambers*: Cut down to an average by caterpillars during September. *Macon*: Crop nearly all open; injured by worms. *Lawrence*: Above a half crop. *Pike*: Injured by rust on uplands, and by army-worms on lowlands, making late crops almost a failure. *Autauga*: Deficiency estimated variously from 40 to 75 per cent.; cotton that did not come up till late in May almost a complete failure. *Perry*: All open, and half gathered; injury from the worms equal to a severe frost; late rains have injured the quality of the lint. *Tuscaloosa*: Greatly injured by drought and worms; the latter eat all the small buds and forms. *Clay*: Worms attacked the crop September 1; acreage increased, hence the crop will be about as large as last year. The fine weather greatly favors its gathering. *Limestone*: Injured by drought, caterpillars and boll-worms.

**MISSISSIPPI.**—*Jasper*: Drought caused the cotton to shed all its forms and young bolls. Caterpillars, though appearing in July, did not do much damage till towards the close of August, since when they have stripped the crop of all that worms can eat; no cotton made since the 1st of August. *Rankin*: Crop shortened a third by insects; it has had seasonable weather. *Tishomingo*: Bolls have dropped badly; crop not over two-thirds; staple short. *Hancock*: Full average, with a slight improvement in the staple; August and September very favorable to the crop. *Warren*: Crop cut down 35 per cent. by drought, boll-worm, and caterpillar; opening premature and harvest early. *Grenada*: Crop shortened by drought, blight, and worms; will fall short one-fourth. *Amite*: Cotton has shed unusually; cotton-worm has been very disastrous; drought also very injurious. *Wayne*: A third of the early cotton and half of the later lost, worms and drought destroying it. *Smith*: But little more than a half crop; half the bottom crop already open and four-fifths of the upland. The largest portion is upland, all of which will be gathered by the 1st of November. *Washington*: Reduced a third below average by drought and insects. *Leake*: About three-fourths average. *Lauderdale*: Twenty-five per cent. below average; mostly open on the 1st of October; staple fair but seed defective, making a stand difficult to obtain next season. *Lee*: Greatly shortened by drought. *Yalabusha*: Shortened by drought fully a third. *Holmes*: Extensive shedding. *Leflore*: Seriously damaged by drought. *Madison*: Storm knocked off about a fifth of the unpicked cotton, September 25 and 26; crop shed badly on account of drought. *Wilkinson*: Earlier-planted cotton injured by boll-worms; later by caterpillars; both kinds by drought. *Winston*: Injured by excessive rains in August, and by drought and worms in September; from two-thirds to three-fourths of an average crop. *Hinds*: Nearly all gathered; late crops a failure through drought and worms. *Attala*: Crops 40 or 50 per cent. below average; early picked and marketed. *Jefferson*: Ten per cent. less than last year; bulk of the crop picked before October 10; some sections gleaning now. *Kemper*: Very little cotton has matured since August 1; fields look as if a heavy killing frost had fallen. *Claiborne*: Will average about as last year in quantity and quality. *Norumbec*: Nearly all open; stripped of leaves by worms but not materially injured; yield about equal to last year's; fine weather for picking.

**LOUISIANA.**—*Union*: Crop cannot exceed three-fourths of an average; staple short; absence of rain will enable the planter to market it clean; army-worm destroying trash. *Richland*: Cotton yield about the same as last year. *Morehouse*: Drought has cut cotton short fully one-half. *Tangipahoa*: Drought and caterpillars have reduced the crop one-half; the last pickings will be light and silky. *East Feliciana*: Drought and the army-worm have shortened the crop and damaged the staple. *Iberia*: Shed half its bolls and forms on account of drought. *Caddo*: Mostly open; will be picked early in October. *Concordia*: Drought and caterpillars have greatly shortened the crop, but a fine picking season enables planters to make the best of what is left; it opens faster than it can be picked. *Claiborne*: Reduced by long drought and by caterpillars. *Washington*: Reduced a half by drought and worms. *West Feliciana*: All open and the picking season drawing to a close; crop several weeks earlier than last year. *Ouachita*: Not over a half crop; will all be gathered by October 15. *Red River*: All open; a rain would injure it still further.

**TEXAS.**—*Coryell*: Almost a failure; crop not over a fourth of an average. No farm in the county will average more than half a bale per acre. This failure is due to drought. *Kaufman*: Acreage doubled, but the crop will be but half average, bringing up the aggregate to about what it was last year. *Burleson*: Crop short, but very clean. *Cherokee*: Drought, since July 5, has cut down cotton to 65 per cent. below average; many fields in the southern part of the county will not yield a bale to ten acres. *Henderson*: Greatly improved by late favorable weather; 15 per cent. above average. *Red River*: Injured badly; black-prairie will yield 1,200 pounds per acre seed-cotton, but timber land will not equal the small yield of last year. *De Witt*: Eaten by worms, yet still of average condition. *Bezar*: Prospect improved somewhat. *Marion*: Greatly shortened by drought. *Rusk*: Opened early in August. *Williamson*: Cotton will average half a bale per acre; nearly all picked, and is being rushed into market. *Upshur*:



Crop injured by drought; perhaps as low as two-thirds of last year. *Austin*: Cotton-fields swept by worms. *Matagorda*: Crop all gathered; generally this requires till the middle of December. *Grayson*: Short one-third from drought. *Hunt*: Drought shortened the July prospects of the crop fully one-half. *Travis*: Season fine for picking, which will be completed this month.

ARKANSAS.—*Craighead*: Cotton very short. *Monroe*: Injured by drought; bottom crop tolerable, but the middle and top crops scarcely worth picking; fully half the cotton is open and a very large proportion has been picked; the crop will nearly all be in market by Christmas. *Bradley*: Damaged by drought. *Drew*: Finest crop prospects ruined since midsummer by drought and worms. *Jackson*: Shortened by drought. *Columbia*: Crop about half of last year's. *Crittenden*: Seriously damaged by drought. *Prairie*: Cut down to half a crop by drought; all will be picked by November 1st. *Sebastian*: Crop good as to lint and texture but cut short a third; no top cotton; average so increased that the aggregate yield will not fall short of last year's. *Woodruff*: Shortened a third. *Marion*: Drought has affected the cotton crop. *Montgomery*: Shortened by drought; half picked already; not over 500 pounds seed-cotton per acre. *Independence*: September drought told fearfully upon cotton; no bolls formed in that month while those of August perished; crop 40 per cent. below average; no better in any county within one hundred miles.

## OATS.

The product of oats is apparently increased, as compared with that of last year, by about 3 per cent., but it will not equal the aggregate of the census-year. Completed calculations may slightly modify the present aggregate of 265,000,000 bushels. The comparison with last year is as follows: Maine, 119; New Hampshire, 98; Vermont, 113; Massachusetts, 95; Rhode Island, 105; Connecticut, 111; New York, 96; New Jersey, 80; Pennsylvania, 100; Delaware, 60; Maryland, 78; Virginia, 76; North Carolina, 130; South Carolina, 92; Georgia, 120; Florida, 90; Alabama, 97; Mississippi, 99; Louisiana, 105; Texas, 116; Arkansas, 107; Tennessee, 124; West Virginia, 98; Kentucky, 109; Ohio, 93; Michigan, 96; Indiana, 111; Illinois, 112; Wisconsin, 105; Minnesota, 108; Iowa, 100; Missouri, 122; Kansas, 150; Nebraska, 136; California, 103; and Oregon, 101.

MAINE.—*Androscoggin*: Very good. *Piscataquis*: Very good quality. *Oxford*: Good crop, well secured.

MASSACHUSETTS.—*Norfolk*: Above average in quantity and quality. *Berkshire*: Injured by storms requiring it to be mowed like hay.

RHODE ISLAND.—*Kent*: Rusted and blighted; not worth cutting.

NEW YORK.—*Ulster*: Too wet and hot for oats. *Madison*: Crop good, but injured in the shock by rains. *Genesee*: Grain shrunk by drought. *Sullivan*: A good yield though damaged by bad weather at harvest.

PENNSYLVANIA.—*Lancaster*: Equal in quantity to last year, and heavier. *Armstrong*: Injured 5 per cent. in the shock, yet good. *Centre*: Damaged by damp. *Elk*: Dampness reducing the quality of oats.

VIRGINIA.—*Rappahannock*: A great failure. *Essex*: Raised in but small quantities, owing to repeated failures. *Chesterfield*: A large acreage sown in oats. *Highland*: Much shortened by drought. *Clarke*: Schonen oats, though crippled by drought, are much better than common oats on the same farm. *Nansemond*: Oats nearly average, but shortened by drought. *Madison*: Very indifferent; Schonen ruined by storms.

NORTH CAROLINA.—*Forsyth*: Never better; price 50 cents per bushel. *Franklin*: Good. *Alamance*: Above average. *Stanly*: Injured by drought.

GEORGIA.—*Gwinnett*: Oats 50 per cent. better than last year, both in quantity and quality.

FLORIDA.—*Lery*: Seriously injured by drought in May, but the increased acreage will bring up the aggregate yield to last year's; seed-oats are worth \$1.50 to \$2 per bushel.

MISSISSIPPI.—*Smith*: Materially injured by drought.

TENNESSEE.—*Giles*: Greatly injured in the shock. *Dickson*: Shortened by drought. *Hancock*: Good crop. *Jefferson*: Better than last year's. *Wilson*: About average.

KENTUCKY.—*Lincoln*: Average.

OHIO.—*Medina*: Crop smaller than indicated by previous appearances.

MICHIGAN.—*Emmett*: Oats rotting in the stack and on the ground.

INDIANA.—*Owen*: Very fine up to harvest; enormous in quantity but depreciated in

quality by rain. *Darvess*: Best crop in twenty years. *Kosciusko*: Cut down by drought to a half crop.

MINNESOTA.—*Goodhue*: Marked increase in yield.

ILLINOIS.—*Carroll*: Injured somewhat by the army-worm; market-price 17 cents per bushel. *Crawford*: Damaged in the shock by wet. *Bureau*: Heavy crop. *Peoria*: Heavy yield but damaged by rain at harvest. *Putnam*: Crop large but damaged by rain at harvest. *Douglass*: Did not pay for harvesting. *Ogle*: Injured by the army-worm, (*Leucania unipuncta*). *Boone*: Increased acreage but inferior in quality.

IOWA.—*Story*: Injured by storms. *Montgomery*: Bring only 8 to 17 cents per bushel; demand only local. *Harrison*: Crop heavy but considerably fallen. *Muscatine*: Crop enormous; grain good. *Howard*: Growth abnormally stimulated by alternate damp and heat, hence the grain is badly shrunk. *Mitchell*: Fair crop harvested, but not so large as was anticipated.

MISSOURI.—*Cass*: Mostly spoiled in the shock by heavy rains. *Ralls*: Quite favorable. *Putnam*: Oats 15 cents per bushel. *Newton*: Increased acreage; larger yield and better quality than last year.

KANSAS.—*Douglass*: Good; selling at 15 to 20 cents per bushel. *Lincoln*: Nearly as good as last year. *Riley*: Large acreage; yield light but of good quality.

NEBRASKA.—*Nemaha*: Large acreage and an extraordinary crop. *Washington*: Very good; largest crop for many years. *Boone*: Surpasses expectation.

OREGON.—*Curry*: Crop remarkably heavy.

## BARLEY.

The barley product is slightly above that of last year in all the Western States except Missouri, Ohio, and Indiana, and is also increased in Tennessee and Texas. A decrease is apparent in all the Atlantic States. The indications scarcely favor as large a total aggregate as last year. The principal producers are California, New York, Illinois, Iowa, Wisconsin, and Ohio. The quality is also below average in most of the States. The States reporting less than 100 are: New Hampshire, 96; Vermont, 93; Massachusetts, 99; Rhode Island, 95; New York, 94; Pennsylvania, 96; Maryland, 86; Georgia, 91; Ohio, 90; Indiana, 92; Missouri, 93. Those returning 100 are: Connecticut, Kentucky, and Michigan. States above 100: Maine, 120; Texas, 122; Tennessee, 105; Illinois, 101; Wisconsin, 101; Minnesota, 102; Iowa, 104; Kansas, 110; Nebraska, 123; California, 121; Oregon, 118.

## RYE.

The rye crop appears to be smaller by 2 per cent. than that of last year. The quality is generally good, though slightly below average in New Hampshire, Vermont, Massachusetts, New York, Pennsylvania, Maryland, South Carolina, Ohio, Michigan, Minnesota, Iowa, and Missouri. The comparative production is thus stated: Maine, 102; New Hampshire, 99; Vermont, 92; Massachusetts, 97; Rhode Island, 94; Connecticut, 105; New York, 93; New Jersey, 88; Pennsylvania, 92; Delaware, 106; Maryland, 100; Virginia, 95; North Carolina, 107; South Carolina, 109; Georgia, 135; Florida, 80; Alabama, 95; Mississippi, 90; Louisiana, 100; Texas, 113; Arkansas, 100; Tennessee, 107; West Virginia, 104; Kentucky, 150; Ohio, 94; Michigan, 95; Indiana, 97; Illinois, 101; Wisconsin, 96; Minnesota, 111; Iowa, 100; Missouri, 80; Kansas, 95; Nebraska, 95; California, 109; and Oregon, 98.

## POTATOES.

The potato crop will be comparatively short. The only States indicating average condition are North Carolina, Texas, Arkansas, Kentucky, Illinois, Iowa, Wisconsin, and Minnesota. Rot has appeared again in many portions of the New England States; the Colorado beetle,

though kept under by the suggestions of the entomologists and "eternal vigilance" on the part of the grower, has been marching eastward, and is at work in Pennsylvania and West Virginia; and drought has injured late potatoes in the central parts of the West.

MAINE.—*Penobscot*: Crop rotting considerably. *York*: Few and rotting badly. *Androscoggin*: Light crop and rotting badly. *Waldo*: Almost a failure from rust and rot. *Piscataquis*: Small and rotting badly. *Lincoln*: Ruined by rain; rotting badly. *Oxford*: Poor and rotting badly; digging delayed by rain. *Cumberland*: Loss by rot 25 per cent. *Sagadahoc*: Rotting badly; later plantings almost a failure.

NEW HAMPSHIRE.—*Strafford*: Strong indications of the potato rot. *Hillsborough*: Rotting badly through excessive rains. *Belknap*: Failure through damp weather.

VERMONT.—*Franklin*: Crop light and rotting. *Addison*: Three-fourths destroyed by rot. *Chittenden*: Rotting badly.

MASSACHUSETTS.—*Norfolk*: Early varieties yielded largely but were of inferior quality. *Middlesex*: Too hot and wet for potatoes; some rot.

CONNECTICUT.—*New London*: Early potatoes yield well; later varieties not so well.

NEW YORK.—*Ulster*: Season too wet and hot for potatoes. *Steuben*: Improved by late rains. *Lewis*: Very promising; early crops fine. *Jefferson*: Sound and fair.

PENNSYLVANIA.—*Cumberland*: Condition equal to last year, but the yield smaller. *Franklin*: Late potatoes suffering; Peerless the most successful variety. *Washington*: Early crop not so good; bugs plenty in some places. *Bucks*: Average in quantity, but below average in size. *Armstrong*: Extra good and large. *Elk*: Rotting considerably. *Clearfield*: Doubtful condition; some good, some indifferent.

MARYLAND.—*Baltimore*: Much reduced by drought, but of good quality. *Howard*: Shortened by drought. *Cecil*: Early potatoes very small. *Anne Arundel*: Destroyed by drought.

VIRGINIA.—*Rappahannock*: Half crop. *Prince George*: Very indifferent; sweet potatoes, average. *Essex*: Injured by drought. *Princess Anne*: Sweet-potatoes seriously injured. *Highland*: Very good. *Clarke*: A failure in two-thirds of the county. *Northampton*: Short crop anticipated. *Elizabeth City*: Very poor, on account of drought. *Madison*: Below average; sweet-potatoes above.

NORTH CAROLINA.—*Gaston*: Very fine. *Greenville*: Sweet-potatoes greatly shortened by drought. *Craven*: Army worms in cotton. *Greene*: Sweet-potatoes doing well; with a late fall they will be an average crop. *Warren*: Crop large, fine, and secured in good condition.

SOUTH CAROLINA.—*Orangeburgh*: Inferior. *Richland*: Badly affected by early and late drought. *Lexington*: Sweet-potatoes injured by drought.

GEORGIA.—*Dooley*: Injured by drought. *Marion*: Sweet-potatoes injured by drought. *Murray*: Short.

FLORIDA.—*Jackson*: Sweet-potatoes short from late planting. *Clay*: Sweet-potatoes injured by drought. *Taylor*: Very fair crop. *Lery*: Sweet-potatoes injured by caterpillar and drought, but the increased acreage will bring the yield up to last year's.

MISSISSIPPI.—*Smith*: Sweet-potatoes shortened by drought. *Wilkinson*: Sweet-potatoes cut short by drought.

LOUISIANA.—*Morehouse*: Sweet-potatoes almost a failure. *Washington*: Much injured by drought.

TEXAS.—*De Witt*: Sweet-potatoes very poor. *Medina*: Sweet-potatoes shortened by drought. *Marion*: Greatly shortened by drought. *Rusk*: Too dry for sweet-potatoes. *Austin*: Sweet-potatoes a failure. *Upshur*: Crop injured 10 per cent. by drought. *Kendall*: Prospects for sweet-potatoes not flattering.

TENNESSEE.—*Dickson*: Shortened by drought. *Monroe*: Injured by drought. *Bradley*: Almost a total failure on high ground. *Lincoln*: Injured by drought. *Humphreys*: Potatoes full average, though late crops a failure. *Stewart*: Very short through drought. *Morgan*: Injured by drought. *Hardin*: Potatoes and sweet-potatoes shortened by drought. *Wilson*: Potatoes the finest crop ever raised; sweet-potatoes damaged by drought.

WEST VIRGINIA.—*Jefferson*: Rapidly improving. *Wayne*: Crop beyond expectation.

KENTUCKY.—*Daviess*: If frost keeps off twenty days, our potato-crop will be three times last year's.

OHIO.—*Noble*: Late planted injured by drought; Colorado beetle destructive. *Washington*: Peachblows withered; vines died and the tubers very watery and poor. *Medina*: Not equal to last year; Early Rose especially shortened by drought but of good quality; other varieties inferior in quality. *Franklin*: Late potatoes a failure through drought and the Colorado beetle. *Hardin*: The crop greatly benefited by late rains. *Crawford*: Excellent. *Delaware*: Unusually good. *Portage*: Under aver-



age on account of the intense heat of August. *Hamilton*: Late crop destroyed by the Colorado beetle.

MICHIGAN.—*Cass*: Bad failure through drought and the bugs. *Shiawassee*: Injured by bugs; late varieties improving under the fine rains.

INDIANA.—*Perry*: Crop lost beyond hope. *Kosciusko*: Early potatoes fine; late ones not worth digging. *Switzerland*: Late potatoes shortened by drought. *Pike*: Shortened by drought. *Martin*: Late potatoes shortened by drought. *Gibson*: Early Rose and Shaker Russet potatoes very good. *Lagrange*: Cut down by potatoe-bugs to half a crop.

ILLINOIS.—*Alexander*: Early plantings fine in quantity and quality; later shortened by drought. *Franklin*: Injured by drought; only early plantings a success. *Bureau*: Sweet-potatoes very poor. *Lee*: Very light. *Tazewell*: Largest crop yet raised.

WISCONSIN.—*Clark*: Very little rot among potatoes. *Sheboygan*: Good; better than was expected. *La Fayette*: Fine; season propitious.

MINNESOTA.—*Ramsay*: Very much injured by Colorado beetles.

IOWA.—*Harrison*: Short in yield and size; sweet-potatoes do well; culture increasing. *Johnson*: Below last year's crop, but the acreage exceeds that of any former year. *Muscatine*: Full crop. *Mitchell*: Excellent.

MISSOURI.—*Cass*: Quality good, but few in a hill. *Ozark*: Injured by Colorado beetle; sweet-potatoes below average. *Reynolds*: Potato bugs active. *Phelps*: Late potatoes injured by dry weather. *Perry*: Late potatoes almost a failure.

KANSAS.—*Douglass*: Good; bringing 20 to 30 cents per bushel. *Lincoln*: Crop No. 1. *Jackson*: Sweet-potatoes the finest yet known. *Cloud*: Sweet-potatoes killed by frost September 22.

NEBRASKA.—*Gage*: Potatoes poor.

OREGON.—*Tillamook*: Total failure; disease prevailing, similar to the great potato-rot of twenty-three years ago. *Curry*: Greatly damaged by bugs.

## FALL FEED AND PASTURES.

MAINE.—*Penobscot*: Fall feed remarkably good. *Oxford*: Pastures and fields as green as in June, but little grass cut. *Lincoln*: Fall feed fine. *Piscataquis*: Hay-crop large. *Waldo*: Fall feed never better. *Sagadahoc*: Fall feed luxuriant; cattle in fine condition.

NEW HAMPSHIRE.—*Hillsborough*: Pastures very fine.

VERMONT.—*Addison*: Pastures very fine. *Chittenden*: First crop of hay largely uncut.

MASSACHUSETTS.—*Norfolk*: Pastures never better; second hay-crop very heavy, but constant rains have given but poor opportunities of curing it. *Plymouth*: Hay-crop very large, but a large portion of the second cutting imperfectly cured on account of rain; abundant stock of winter fodder; fall pastures fine. *Middlesex*: Second grass-crops heavy; pastures very fine.

RHODE ISLAND.—*Kent*: Fall feed abundant.

CONNECTICUT.—*Middlesex*: Fall feed very abundant.

NEW YORK.—*Columbia*: Frequent showers have kept fall pastures and meadows in fine condition. *Genesee*: Shortened by drought. *Niagara*: Feed short. *Ontario*: Fall feed plenty. *Allegany*: Grass much better than last year.

NEW JERSEY.—*Gloucester*: Second hay-crop, with crab-grass, has brought the grass-crop to a full average.

PENNSYLVANIA.—*Beaver*: Pastures improved by late rains.

MARYLAND.—*Carroll*: Clover-seed good in the northern part of the county, but poor in the southern part where the drought was severe; hay a half crop. *Howard*: Abundant rains have finely brought out fall pastures. *Cecil*: Late rains have greatly improved fall pastures.

VIRGINIA.—Pastures dried up. *Stafford*: Pastures injured by drought. *Rappahannock*: Late rains have made crab-grass very abundant. *Essex*: Short pasturage. *Princess Anne*: Poor stand of young clover, it having died out by reason of dry weather. *Campbell*: Late rains have made better pastures and fatter cattle. *Fairfax*: Fall pastures fine, enabling cattle to commence winter in better condition. *Prince William*: Greatly improved by August rains, making fall feed very plenty to partially compensate for a deficient hay-crop. *Lancaster*: Pastures very indifferent.

GEORGIA.—*Gordon*: Crab-grass and hay very fine. *Whitfield*: Fall pastures poor.

LOUISIANA.—*Tangipahoa*: Hay-crop greatly shortened by drought.

TEXAS.—*Smith*: Grass nearly dried out. *Harris*: Grass nearly dead. *Medina*: Prairie pastures but 15 per cent. of an average; mountain pastures better. *Nueces*: Cattle on the ranges much poorer than last year; pastures shortened by drought. *Live Oak*: Grass burned up.

TENNESSEE.—*Giles*: Pastures dried up. *Gibson*: Stock in bad condition; pastures dried up. *Hancock*: Hay and pasture excellent.

WEST VIRGINIA.—*Braxton*: Pastures fresh and good. *Jefferson*: Warm, wet weather



has greatly improved fall pastures. *Morgan*: Fall pastures fine; cattle consequently greatly improved. *Monroe*: Cattle fat.

KENTUCKY.—*Nicholas*: Pastures burned up; grass scarce. *Daviess*: Fall pastures short, but reviving under late rains. *Clinton*: Plenty of fall feed. *Lincoln*: Short pastures.

OHIO.—*Defiance*: Fall pastures doing finely. *Hardin*: Late rains have finely brought out fall pastures; hay crop light; second crop of clover good—heavier than the first. *Crawford*: Pastures good, and cattle fat. *Madison*: Pasture never better. *Warren*: Pastures excellent. *Fayette*: Fall pasture drying up.

MICHIGAN.—*Shiawassee*: Hay crop better than was anticipated; supply ample.

INDIANA.—*Perry*: Literally burned up. *Miami*: Hay our only crop below average. *Hamilton*: Fall pastures fine. *Franklin*: Pasture abundant.

ILLINOIS.—*De Kalb*: Pasturage very fine; hay crop large and of superior quality. *Alexander*: Hay thin and light; pastures enlivened by late rain. *Lee*: pasture splendid. *Boone*: Pastures excellent.

WISCONSIN.—*La Fayette*: Fall pastures fine; cattle fat.

MINNESOTA.—*Le Sueur*: Hay very much damaged. *Ramsay*: Hay injured by wet in the stack. *Winona*: Wet season made the grass coarse and succulent.

IOWA.—*Montgomery*: Sufficient hay for winter-feeding secured before frost. *Clinton*: The largest crop of fall grass known.

MISSOURI.—*Harrison*: Pasturage good. *Ralls*: Cattle in fine condition for fattening. *Lincoln*: Cattle in fine condition.

KANSAS.—*Douglass*: Hay-crop very heavy. *Coffee*: A large amount of prairie-hay gathered.

CALIFORNIA.—*Del Norte*: Pastures very short. *San Joaquin*: Pastures good; cattle in better condition than last year on hay and grain.

OREGON.—*Grant*: Fall pastures greatly improved by early rains in September; to this is attributed a great improvement in beef-cattle. *Columbia*: Pastures not near so good as usual; cattle beginning to fall off. *Douglass*: Pastures short; stock not doing well in consequence. *Tillamook*: Pastures overstocked and cattle depreciating. *Curry*: Pastures very short.

UTAH.—*Rich*: Native grasses very abundant; large quantities of hay stored for winter.

ARIZONA.—*Yuma*: Pastures fine; better than for years.

WASHINGTON.—*Walla-Walla*: Grass starting finely from recent rains.

Table showing the condition of the crops, &amp;c., on the 1st day of October, 1872.

STATES.	WHEAT.		RYE.		OATS.		BARLEY.		BUCK- WHEAT.	Average com- dition Octo- ber 1.	POTATOES, ( <i>Solanum tuberosum</i> ).—Average condition Octo- ber 1.	POTATOES, ( <i>Batatas edulis</i> , sweet).— Average condition October 1.
	Product com- pared with last year.	Average qual- ity compared with last year.	Product com- pared with last year.	Average qual- ity compared with last year.	Product com- pared with last year.	Average qual- ity compared with last year.	Product com- pared with last year.	Average qual- ity compared with last year.				
Maine.....	109	99	102	102	119	104	120	103	88	100	77	77
New Hampshire.....	98	100	99	98	98	93	96	95	110	110	64	64
Vermont.....	95	89	92	95	113	86	93	93	96	113	96	64
Massachusetts.....	90	90	97	97	95	98	99	94	97	102	97	64
Rhode Island.....	91	102	102	105	105	100	95	100	100	100	95	63
Connecticut.....	96	98	105	106	111	109	100	100	94	111	91	61
New York.....	70	88	93	98	96	93	94	91	91	106	95	65
New Jersey.....	80	102	88	101	80	93	96	95	95	110	91	91
Pennsylvania.....	60	94	92	98	100	97	96	95	100	90	94	101
Delaware.....	75	110	106	100	60	77	97	92	100	97	67	47
Maryland.....	66	102	100	97	78	92	86	92	100	97	67	47
Virginia.....	101	107	95	102	76	92	91	91	97	92	110	103
North Carolina.....	136	123	107	103	130	122	91	103	55	103	93	87
South Carolina.....	113	110	109	99	92	92	92	92	105	105	92	90
Georgia.....	181	123	135	105	120	110	91	103	103	103	92	87
Florida.....	133	120	95	103	90	102	103	103	106	106	93	80
Alabama.....	101	103	90	105	99	91	122	105	131	131	70	70
Mississippi.....	320	128	113	102	105	105	105	105	92	91	33	33
Louisiana.....	102	105	100	101	107	104	105	96	101	101	33	33
Texas.....	200	108	107	108	124	108	105	96	97	103	33	33
Arkansas.....	104	104	104	102	98	96	100	101	102	112	103	33
West Virginia.....	175	112	150	111	169	103	100	101	102	112	103	33
Kentucky.....	85	100	94	95	93	89	90	93	94	100	94	94
Ohio.....	86	95	95	98	96	94	100	99	95	110	96	96
Michigan.....	101	100	97	101	111	98	92	97	95	110	103	95
Indiana.....	98	101	101	101	112	98	101	97	95	110	103	95
Illinois.....	121	102	96	100	105	97	101	98	96	105	106	96
Wisconsin.....	128	99	111	99	108	106	102	94	100	103	101	98
Minnesota.....	112	101	100	99	100	99	104	96	95	107	103	98
Iowa.....	98	98	99	99	122	106	93	96	92	107	97	100
Missouri.....	60	93	90	101	150	101	110	97	91	112	99	98
Kansas.....	80	102	95	105	136	109	123	110	100	104	95	97
Nebraska.....	140	102	109	100	103	104	101	100	104	104	97	103
California.....	175	102	109	100	103	104	101	100	101	103	97	103
Oregon.....	105	101	98	100	101	103	118	100	101	103	87	87

STATES.	TOBACCO.	BEANS.	PEAS.		SORGHUM.	STAG-CANE, (not sorghum).—Average condition October 1.		COTTON.	OLD WHEAT.	FATTENING CATTLE.	
	Average com- dillon Octo- ber 1.	Average com- dillon Octo- ber 1.	Average com- pared with last year.	Average com- dillon Octo- ber 1.	Average com- dillon Octo- ber 1.			Average com- dillon Octo- ber 1.	Average amt of old wheat compared with last year.	Number of fat- tening cattle compared with last year.	Average com- dillon Octo- ber 1.
Maine.....		102	101	100					97	95	127
New Hampshire.....		103		98					100	92	111
Vermont.....		73	102	100					99	101	121
Massachusetts.....		98	98	98	82				102	95	108
Rhode Island.....		100	100	100						92	100
Connecticut.....		95	101	96					100	101	103
New York.....		97	98	95	100				82	101	106
New Jersey.....		94	100	105	100				86	95	100
Pennsylvania.....	105	100	100	100	100				83	96	106
Delaware.....		100	100	100					77	100	97
Maryland.....		98	100	105					87	92	97
Virginia.....	102	98	94	94	105			85	78	97	99
North Carolina.....	103	94	106	105	93			90	92	102	106
South Carolina.....	105	104	106	106	96	95		86	83	102	113
Georgia.....	105	91	100	88	105			88	86	100	104
Florida.....		102	113	95	105	95		75	95	103	
Alabama.....		106	98	96	97	97		85	72	101	
Mississippi.....	106	90	91	79	95	90		78	106	102	97
Louisiana.....		75	102	78		83		83	83	94	85
Texas.....		89	97	76	102	96		85		106	97
Arkansas.....	100	92	80	76	88			75	90	101	97
Tennessee.....	97	93	100	90	101			90	112	102	90
West Virginia.....	102	99	100	90	16				70	104	107
Kentucky.....	101	104	103	102	100				96	100	104
Ohio.....	106	104	100	98	100				88	102	103
Michigan.....		98	102	97	100				71	102	104
Indiana.....		97			101				74	37	107
Illinois.....		97	99	97	97				83	100	103
Wisconsin.....	99	100	99	96					53	100	102
Minnesota.....	95	97	100	100	102				63	100	101
Iowa.....	102	102	103	96					50	104	102
Missouri.....	97	103	97	95	98			93	79	111	101
Kansas.....	103	99	97	100	99				61	104	105
Nebraska.....	99	95	96	96	110				62	119	104
Nebraska.....		100			110				69	119	101
California.....		101	93	93					61	114	105
Oregon.....		99	94	102					80	99	95



# CULTIVATION AND HYBRIDIZING OF WHEAT.

BY THE COMMISSIONER OF AGRICULTURE.

I have heretofore taken occasion to draw the attention of farmers to the fact that, in the midst of the decided progress which is being made in knowledge, which is necessarily the result of experience, and notwithstanding the great advantages which are afforded by the superior skill with which improved implements are used, the wheat crop of the country has depreciated, certainly in quantity, and, perhaps, to some extent in quality. Wheat is justly estimated, as to its relative value, as a primary article of production, as well as a profitable result of industry. It behooves, therefore, all who are concerned in the production or use of this valuable cereal to consider well all the circumstances which affect its quantity or deteriorate its quality.

This paper is indited for the purpose of making two suggestions, each of which I commend to the serious consideration, and criticism, too, of all who take any interest in the subject.

The only marked change which has occurred in the routine of cultivation in the Northern and Middle States, and which is, doubtless, being followed in the Western States, is the abandonment of the use of rye as a rotating crop. This has undoubtedly been produced by the conviction that a second crop of wheat, which has lately become almost universal, is more profitable than to follow wheat with rye. This is, perhaps, a short-sighted view of the subject, for while the second crop of wheat may produce more money than the crop of rye, the ultimate profit to the farmer is exceedingly questionable. In drawing upon the land for a second crop of wheat, you again call upon it for that which you have already taken; you call upon it to perform a work in which it has been already engaged for nearly a whole year. To use an appropriate analogy, you call upon a man, without rest or food, to continue through the night the work in which he has been engaged all day. While the body may endure the additional and extraordinary exercise of power, it is left in a state of exhaustion, unfitted to respond to any future immediate call upon his health and strength. The simile is almost perfect; the land is called upon to perform a task which it has just finished, and it is thereby left in a state of comparative exhaustion; and although from its great quality of fruitfulness it may be productive and survive this extraordinary draught upon its natural capacity, yet it is left in a condition of frailty which time only cures, and this, perhaps, more than counterbalances the immediate profit of the second wheat crop.

There is another view of this subject which deserves consideration. And here let me borrow another familiar analogy. The physical energies of any animal are unequal to a continual draught upon the same muscular powers of the body. To walk up a flight of stairs, or upon a long continued level plain, bringing into requisition the same muscles, produces a degree of exhaustion which a like amount of diversified work would not effect. Now, while we may not be able to understand all the physical powers of the earth involved in the growth of its productions, nor to define how or what are its operations, all are convinced, from the evidence of actual observation, that these powers become exhausted from too severe use, and fail to respond to our great cupidity.

What and how many kinds of crops shall make up a proper rotation, is a question which involves the mysterious inquiry, how the growth of



one crop affects that succeeding it. Experience has taught that timothy and clover *take* better when sown with rye than with wheat, and nature almost always dictates nicely in the operations of agriculture. It may be that rye affords an essential element in a proper and natural rotation, and it is earnestly suggested that in the order of crops it be restored to the place it held some forty years ago.

The second suggestion which I have to make is, that the various varieties of wheat are supposed to become so mixed as to lose their identity. It is in vain that the earliest and best seed is sought after if its product be negligently commingled in the barn, by accident or design, with other wheat having entirely different, and may be indifferent, qualities. It should be remembered that wheats grow differently, ripen at different periods, and when ground, require different treatment. It is a matter, then, of no little consequence that they should be preserved in their original purity of kind, and true to their names. And in this connection I remark that my observation has led me to the conclusion that wheats do not hybridize or cross-breed by any natural process. This is a daring proposition, and one which conflicts with much written authority. The suggestion is made for the purpose of eliciting a more minute examination of the subject than has hitherto been given to it.

That the unscientific reader may the more readily comprehend the principles of hybridizing and cross-breeding, as they are effected through the generative organs of the vegetable kingdom, I quote from an article by Horace Piper, in the report of the Department of Agriculture for 1867, page 296, wherein the first principles of reproduction are so clearly and intelligently stated. The author says:

If we examine attentively a perfect flower, we shall find that it consists essentially of two sets of organs, one called the pistils, and the other the stamens. The pistils are located in the center of the flower, and the stamens around them. The summit of the pistil is called the stigma, and on the top of each stamen is situated an anther, a small sack which contains the pollen or fine dust-like substance that fertilizes the ovules or young seeds of the plant. These organs are supposed to perform offices analogous to those of the animal kingdom—the stamens representing the male, and the pistils the female organs. When the anthers, which contain the pollen, arrive at a certain degree of maturity, they suddenly open and emit a multitude of minute grains of pollen, which penetrate through the whole extent of the vascular tissue of the pistil, and ultimately reach the ovules, thus fertilizing them and making them capable, when mature, of reproducing plants of their own kinds.

The author then proceeds interestingly, and in language intelligible to the plainest comprehension, to discuss how admirably nature has provided the *modus operandi* by which the male and female portions of the plant are brought into contact with each other, and produce the fertilization which results in fruit; but while he treats of perfect flowers, where the stamens and pistils are in the same flower, as in the apple; where they are in different flowers, as in the oak; and where they are in different flowers and different plants, as in the hemp—in all of which the pollen is conveyed by artificial aids, such as the wind, birds, bees, or insects—he does not refer to those cases in which nature has so constructed the flower that access of pollen from other flowers is entirely excluded, and hence natural hybridization is practically impossible.

Dr. George Vasey, the botanist of this Department, in commenting upon my views of this subject, says:

In those leguminous plants with papilionaceous flowers, the anthers are kept in contact with or in proximity to the stigma by the keel petals, which closely embrace them until fertilization is effected. This is designated "close fertilization, in contradistinction from those cases where the organs are freely exposed to the air and liable to intermixture. In some plants of the fumitory family, the anthers and stigma are

confined by a close-fitting sac, formed of the two inner petals of the flower. In other cases the fertilizing organs are contained and kept in contact in long tubes, where access of foreign pollen is apparently excluded. Indeed, in some flowers where the stamens and pistils are exposed to the air, nature apparently furnishes special provision for self-fertilization, as in the *Kalmia*, where the anthers are contained in little sacs or pouches of the corolla until the pollen is mature, when by an elastic spring of the filament the anthers are liberated and thrown toward the pistil and the pollen diffused upon it. In some plants of the nettle family the filaments are folded spirally until the sepals expand, when they rise with elastic force and scatter the pollen. In these and other cases which might be mentioned, although cross-fertilization is not absolutely excluded, yet the provision seems to be specially designed for self-fertilization.

On this subject we may quote a remark of Professor Henfrey, in his admirable "Elementary Course of Botany:"

Though cross-fertilization is very general, yet there are some cases where every adaptation seems to be made with the view of securing self-fertilization, as in the following case: In *Dombeya* the sterile stamens are longer than the fertile ones, and are endowed with a power of movement in virtue of which they curve downward and outward, so as to come in contact with the fertile stamens whose anthers open outwardly. In this manner the sterile stamens become dusted with pollen, and then become uncoiled and assume an erect position, so as to come in contact with the stigma, whose curling lobes twist round them and receive the pollen from them.

Other instances are well known to botanists where fertilization takes place in the bud before the expansion of the flower, in which cases self or close fertilization only is possible.

By my direction Dr. Vasey, with the aid of Professor Taylor, of this Department, made a dissection and microscopic examination of two and twenty flowers of wheat in different stages as they approached maturity. Watching the progress of this examination, because I deemed the subject as interesting as it is important, I am strongly impressed with the belief that wheat is a result of close fertilization, and that cross-breeding in this plant never occurs but by artificial means.

The impression is so universal, that by sowing different kinds of wheat together they will cross-breed, and thus partake of the character of each parent, that the hypothesis should be further investigated, and the truth established by conclusive authority.

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## SYSTEMATIC CROP REPORTS.

There has frequently been expressed, in commercial papers and in industrial addresses, a vague desire for "systematic crop reports," without the slightest indication of what that system shall be, or wherein it should differ from that already inaugurated by this Department. There has been much of "glittering generality," but absolutely nothing of practical suggestion to aid in establishing a better system. There has sometimes appeared a querulous dissatisfaction with present means of information, but never a spark of originality in furnishing superior facilities.

News editors sometimes claim that the newspapers are the best sources of knowledge concerning the crops. What are the sources of newspaper information? A glance at green fields through car-windows, in intervals of deep cuts and subterranean passages; a casual inquiry at railway-stations of a farmer, the extent of whose observation and judgment is unknown; local correspondence, not unfrequently the diseased fancy of a croaker, and sometimes the estimate of true observation and fair



judgment. Occasionally a newspaper, with commendable enterprise, solicits crop statements from the area of a State, or several neighboring States, and obtains irregularly located returns, desultory, fragmentary, combining several crops in one generalization, one having no points of comparison with another, altogether defying interpretation in figures or by any other method of consolidation into one definite expression of quantity or value. More frequently commercial runners or dealers in cereals, wool, meats, or fruits, hired to aid in depressing or raising prices, supply, from all quarters, these news items, tinted with roseate or cerulean hues as best may suit the purpose of their principals. Are these statements reliable? Do they admit of systematic compilation and accurate generalization? Is there not a need of greater accuracy, system, and thoroughness than any newspaper can attain in the haste consequent upon its daily issue?

Some writers upon "systematic crop reports" have suggested the appointment of a person in each congressional district to collect and collate crop news. The cost of such service, with traveling and other expenses, would be at least a round million of dollars, and it would prove entirely impracticable and useless, requiring a whole season to traverse the territory sufficient to make one report, while observation in any one county would cover a stage of growth different from that observed in any other.

If there is a better system than that adopted by this Department it should supersede the present; or, if modification of the official plan would improve it, suggestions founded in sound sense will be promptly considered and tested. As many evidently do not understand this plan a brief description is given.

A statistical correspondent is selected from each county in the States. The nomination is made by officers of agricultural societies, by members of Congress, or by individuals of known character for judgment and integrity. The qualifications requisite are, large facilities for observation of growing crops, sound judgment in agricultural matters, and promptness in responding to circulars of inquiry, both regular and special. The position is honorary rather than remunerative, affording no temptation to mercenary unfitness, offering only co-operation of the Department in local improvements, and such incidental favors, in its documentary and other distributions, as may serve to indicate a just appreciation of the unselfish efforts of public-spirited farmers in the improvement of their respective neighborhoods. These deserving appointees continue faithfully, year after year, a service rendered more efficient by repetitions of its performance, and report, in the first week of each month, with a uniformity and promptness scarcely equaled by salaried agents under compulsory requirement of prompt correspondence. They also respond willingly to systematic inquiry upon special topics for investigation, as wages of farm labor, cost of fences, statistics of bee-keeping, and any specialty demanding a systematic collection of facts, from original sources. These men associate with themselves several assistants, representing different sections of the county, thus constituting a county board of crop statistics. The inquiries are forwarded several weeks in advance, and copies are placed in the hands of these assistants, in season to make the requisite observations, and correspond or confer with the principal, who is then ready to make a deliberate and trustworthy return. The tabulated returns for October, pages 430, 431, in answer to twenty-two separate inquiries, will illustrate the range of the monthly schedules, which vary constantly with the season.

These returns, coming in throughout the first half of each month,



many of the more distant requiring a period of ten days in the transmission by mail, are tabulated as received, the county percentages summed up, and the aggregate divided by the number of counties. Then, as certain counties may produce of a given crop many times the amount grown in certain others, a compound calculation is made, involving the relative production of the counties, by which the first crude average is corrected and the exact value of the entire returns expressed. It will be seen that the amount of labor involved in this work is herculean, fifty to one hundred calculations often being required to correct the average of a single crop in a single State. In addition to the tabulated returns, "remarks" illustrating the peculiarities of the local situation are made by each correspondent, which are examined, condensed, some of the more noticeable arranged for publication, and the remainder, in spirit if not in substance, enter into the statistician's summary of the monthly crop returns. So many are necessarily of a similar tenor that it would confuse and tire the reader to print in detail "extracts from correspondence" of tenfold the usual length.

It is, of course, understood that the returns which are tabulated are in figures. The unit in all comparisons is 100, *i. e.*, 100 is the area of last year, if comparative acreage is sought; 100 is a healthy normal "condition" of growth and vitality, which should insure, with a continuance of circumstances equally favorable, an average crop; and 100 is an average yield, when the amount of production is asked for. The inquiry is also made, after the harvest is fully over, for the actual local yield per acre in bushels of each crop. From all these returns, sifted, digested, compared, and evident or proven mistakes corrected, and inconsistencies harmonized, the average of each crop for each State and for the United States is found; and the result is evidently more trustworthy than any other mode of estimating hitherto undertaken. Germany has a somewhat similar plan, based upon percentage returns, and the English mode is simply a collection of miscellaneous reports couched in the language of the individual reporters, similar to the systematic collections attempted by newspapers in this country.

These crop-reports are made monthly during the growing season. For several years seven such reports, between April and November, have been tabulated and published. Is there a necessity for more frequent reports? The New York Journal of Commerce has the following, which has been copied by two or three agricultural papers:

At present our only classified crop-reports are those prepared by the Agricultural Department, and sent out monthly. They are not badly done, but, unfortunately, are too late to be of much use; some of the information representing items weeks old, that have already appeared in the papers. At present our best sources of knowledge about the crops are the journals in different parts of the country. If the Agricultural Department would pick up a little more energy, and obtain fresh and early crop-news once a week, instead of monthly, and give it to the press, that would be a decided gain. But if the Signal-Service Bureau could take charge of the work, we would prefer to lodge it there.

If the commercial editors and the public generally will be content with a score or two, or even a hundred, of local reports daily, they can be furnished with ease; if, on the contrary, a comprehensive view of the condition of a crop throughout the country is desired, it is highly probable that *weekly* reports, based upon returns which are two weeks *en route* to this office, cannot be safely promised. The return-circulars are mostly mailed between the 1st and 8th of each month, are tabulated and condensed as they arrive, figured up before all are in, the record is closed by the 15th, and condensed summaries of results telegraphed, as fast as complete, from the 15th to about the 20th of each month; and then

the entire matter is committed to the Congressional Printer, when the responsibility of the Department of Agriculture for promptness ceases. Is greater celerity a reasonable expectation? It may be said that the returns should be telegraphed. But there are no telegraphic stations in a large portion of the counties reported. If there were, \$100,000 per month would not pay the cost. With ten times as many telegraphic reporters as are now required for meteorology by the Signal Service Office, each responding to a tenfold longer list of inquiries, a new disparity occurs in the conditions of crop and of weather-reporting. In one case a look at the thermometer, the barometer, and the sky, &c., suffice for a report; in the other, observation throughout the county, examination of all the various crops, conference with assistants, requiring days of preparation, are absolutely necessary. In view of the character and extent of the work to be done, both in the field and in the office, the absurdity of daily or weekly reports of the condition of crops must be apparent to every practical and reasonable man. The *Christain Union*, of September 4, thus gives the monthly report a character for freshness of news far in advance of the literary monthlies:

Probably every one who looks over the monthly reports from the Department has frequent cause to regret the tardiness of their publication, but printers and publishers will readily appreciate the reasons which make it so difficult to keep such publications up to date. Let the reader take up any of our magazines when they first appear, say about the 20th of the month preceding their date, and he will be surprised at the staleness of the news. Here, for instance, is Harper's, for September. Whatever charges may be brought against that firm we cannot fairly charge them with lack of enterprise, and yet the "Historical Record" for September contains no account of anything that happened after the 24th of July.\* If this be the case where subjects of living and universal interest are treated, how much greater must be the delay where the magazine has to be made up from the reports gathered from every township in the Union. The election in North Carolina, on August 1, was of such importance that every nerve was strained to get in the returns promptly, yet it was only last week that an official count, incomplete at that, was published. There is at present nothing to induce agricultural agents to send in their county reports, and the wonder is that the work is done as well as it is. It is believed, however, that a great improvement can be made, and ought to be made, but increased appropriations are necessary.

It may not be known that the total appropriation to the statistical division of this Department, to cover all expenses of collecting, tabulating, and preparing the crop-reports, as well as the cost of all other statistical investigations, and the preparation of matter for the annual and all other reports, is but \$15,000 per annum. At the same time the real value of the gratuitous service rendered by correspondents cannot be placed at less than \$150,000. The franking privilege also saves a large item of cost, and the blanks and printed reports are an expense of nearly \$15,000 per annum. The crop-return system, exclusive of the other operations of the division, does not cost the Department exceeding \$7,500, or the Congressional Printing-Office more than an equal amount.

With this small expenditure, in the first years of immaturity and incompleteness, a fair analysis of results will show this system to be superior to any hitherto attempted in this country, and to possess capabilities of far greater usefulness if Congress, the press, and the people manifest a liberal and intelligent appreciation of its actual value.

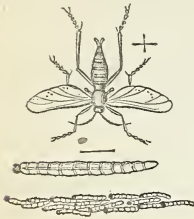
\*The September report of the Department of Agriculture gave the crop report of Oregon, Texas, Florida, and of every other State in the Union, for September, made up and mailed from the 1st to the 10th, a synopsis of which was published September 18th, and the entire number of 84 pages issued in September.



## ENTOMOLOGICAL RECORD.

BY TOWNEND GLOVER, ENTOMOLOGIST.

"ARMY" OR "SNAKE WORM."—A letter was received in the latter part of July from a correspondent, Mr. C. Moralle, of Leesburgh, Virginia, containing a number of very small white worms, or larvæ, having distinct black heads. These worms appeared to be clinging to each other by means of a viscid substance on the surface of their bodies, and formed a small living mass. In the accompanying letter Mr. Moralle stated that what attracted his attention was "the peculiarity about them that they gathered in a long string, resembling a snake, piling themselves up thickly in the middle and tapering at each end, and when they moved the whole mass moved as in one body." Unfortunately these worms were all dead when they arrived, but Mr. Saunders, of this Department, brought a mass of similar larvæ a few days afterward, which had been given him by a gentleman also in Virginia. These specimens were placed in a glass jar, having a small quantity of damp soil at the bottom, and retained their ball-shaped form for some time, and then commenced to creep round the side of the jar on the earth in a string, three or four abreast, and continued traveling for a couple of hours; they then dispersed and buried themselves a short distance under the surface of the earth, and changed into pupæ, appearing six or eight days afterward as perfect flies. These were about one-tenth of



an inch in length, (expanse 0.13,) of a dusky black color, with dark brown legs and dusky wings. Upon examination they proved to be a species of *Sciara*, the larvæ or worms of which usually feed upon decaying vegetable substances, and are frequently found in fungi. The species above mentioned as occurring in Virginia is very similar in habits to a European species, *Sciara thomæ*, which is usually called the snake or army worm in Germany, from its habit of

sometimes assembling in innumerable numbers, creeping among and over each other, and hanging together by means of a viscid moisture, and forming a mass like a snake or rope, sometimes several feet in length, and two or three inches in breadth. The fly of the European species, *Sciara thomæ*, is described as having yellow stripes or points on the abdomen, whereas our American species (at least when dried) does not show any vestige of yellow whatsoever on the abdomen, but is of a uniform dark brown color, although the worm or larva has the same habits of forming snake-like processions. It is somewhat singular that these worms appeared almost simultaneously in two places in Virginia, while no mention is made of their appearing elsewhere.

These insects (*Sciara*) generally do no damage to cultivated vegetation, although one species, *Sciara (Molobrus) mali*, is mentioned by Dr. Fitch as being found in the interior of apples, especially when pierced or eaten out by the codling moth, (*Carpocapsa pomonella*), or other insects, where they merely accelerate the decay of fruit already previously injured. In Europe the larvæ of other species, *Sciara fucata*, and *quinque maculata*, live in putrid or decaying turnips, &c., and have been accused of producing the disease in potatoes commonly known as the "scab." *Sciara pyri* is said to deposit its eggs in the yet unfolded pear-blossoms, the larvæ of which, when hatched, work themselves down to the core, causing the young and yet undeveloped fruit to wither and fall to the ground.

The species found in Virginia probably does no injury to cultivated



plants, but feeds on putrid vegetable substances, under bark of trees, moss, or stones, and in decaying fungi, as a very-similar larva not yet developed into the perfect fly has lately been taken near Washington, feeding by hundreds on the under side of a species of fungus or agaricus, (allied to *Amanita muscaria*), which was completely riddled and destroyed by them. If this is the case in one instance, may it not be probable that these larvæ, when in such multitudes as to entirely destroy the fungi upon which the eggs were deposited and the young-larvæ had previously existed, may find it necessary to emigrate in swarms in search of fresh fungi to feed upon?

**INSECT INJURIES.**—*Lachnosterna*.—In New London County, Connecticut, the grass, in many meadows, was eaten up at the roots by a worm which, most probably, was the *Lachnosterna fusca*. The white grub-worm—a name which popularly designates several species of the *Lachnosterna*—was more or less injurious to corn in Cass County, Michigan; in Noble and Laporte Counties, Indiana; and in Muscatine and Mahaska Counties, Iowa.

**Potato insects.**—The Colorado potato beetle (*Doryphora decem lineata*) is reported by its specific name only in Ohio, where it was destructive to the crops of Franklin, Hamilton, and Noble Counties. The potato crop was molested by insects, not specifically designated, in Washington County, Pennsylvania; in Cass and Shiawassee Counties, Michigan; in Ramsay County, Minnesota; in Reynolds and Ozark Counties, Missouri; and in Curry County, Oregon.

**Cut-worms.**—Some species of the *Agrotis*, commonly called cut-worms, were injurious to corn in Howard County, Maryland, and in Cass County, Michigan.

**Chinch-bugs, (*Micropus (Rhyparochromus) leucopterus*).**—This insect was especially destructive to sorghum in Adams County, Ohio; in Jennings and Brown Counties, Indiana; in Jasper and Phelps Counties, Missouri; and in Linn County, Kansas. The newly-sown wheat crop has felt their ravages in Brown and Jennings Counties, Indiana; in Macon, Boone, Polk, Crawford, Jasper, and Reynolds Counties, and in Linn County, Kansas. Franklin County, Illinois, was overrun with them to the great damage of the corn crop, as also in Jennings and Boone Counties, Indiana; in Macon, Boone, Crawford, Polk, Jasper, Reynolds, Phelps, Miller, and Iron Counties, Missouri, and in Linn County, Kansas. In Crawford County, Missouri, three distinct broods are noted. The first appeared about the 1st of May, and inflicted such damage upon the wheat crop that several fields were plowed up. The second brood came about the last of June, and the third about the last of August. At the last visitation the corn was in milk, and upon it they fell with great voracity, very seriously reducing its yield both of grain and of fodder.

**Army-worm, (*Leucania unipuncta*).**—The army-worm greatly damaged oats in Carroll and Ogle Counties, Illinois. In Cherokee and Labette Counties, Kansas, they did great mischief in newly-sown wheat, especially on stubble ground.

**Hessian fly, (*Cecidomyia destructor*).**—During the spring the fly infested the wheat in Ralls County, Missouri, and in Labette County, Kansas. In the latter-named county it was observed especially in early sown crops.

**Grasshoppers.**—A grasshopper (probably *Caloptenus femur rubrum*) in Lincoln County, Kentucky, cut the buckwheat down close to the

ground. In Thayer County, Nebraska, corn was seriously damaged by another species, *Caloptenus spretus*,

*Pea-bugs*.—The pea-bug (*Bruchus pisi*) troubled farmers in some parts of Davis County, Utah, causing them to discontinue the planting of that crop.

*Cotton insects*.—The cotton caterpillar, or army-worm of the South, (*Anomis xylinæ*), and the boll-worm, (*Heliothis armigera*), completed their summer's work by a very effective demonstration during September. North Carolina, judging from our previous reports, had enjoyed almost entire immunity from this scourge during the summer, but during September it was felt seriously in several parts of the State. Reports of insect depredations have been received from Tyrrel, Wake, Craven, Edgecombe, and Sampson Counties. In Dooly County, Georgia, the caterpillars appeared early in the month, and entirely swept the top crop. They reduced the yield one-half in Calhoun County, and were very mischievous in Muscogee, Lee, Sumter, Worth, Columbia, Heard, Marion, Schley, Wilkinson, Chattahoochee, Upson, Liberty, Whitfield, Clay, and Decatur Counties. In several cases their depredations exceeded anything of the kind previously known, involving the destruction of leaves and bolls entire. In other cases their injuries resulted in the reduction of the yield by a very formidable percentage. Caterpillars and boll-worms, also, figure prominently in the Florida County reports. Serious depredations were committed in Liberty, Jackson, Suwannee, Orange, Gadsden, Jefferson, Alachua, Clay, Columbia, and Levy Counties. In Alabama, the same blighting influence was felt in St. Clair, Hale, Butler, Clarke, Lee, Montgomery, Colbert, Blount, Calhoun, Macon, Chambers, Pike, Autauga, Perry, and Limestone Counties. In some cases, as in Pike County, the brunt of the disaster fell upon the lowland cotton. The mischief appears to have been even still more serious in several counties of Mississippi. In Jasper everything about the cotton plant that a worm could eat was stripped. Complaints are very earnest of these depredations in Rankin, Warren, Grenada, Amite, Wayne, Yalabusha, Lauderdale, Washington, Wilkinson, Winston, Jefferson, Hinds, and Kemper Counties. In several of these counties very little cotton matured after August 1. Louisiana sends reports of insect damages to cotton in Union, Morehouse, Tangipahoa, East Feliciana, Concordia, Claiborne, and Washington Counties. Very great damage was also done in DeWitt and Austin Counties, Texas. In the last-named county whole fields were swept.

## CHEMICAL MEMORANDA.

BY RYLAND T. BROWN, CHEMIST.

**LABORATORY WORK**.—J. E. Johnson, of Saint George, Utah, forwarded to the laboratory a specimen of Indian food, much used by the tribes inhabiting the great central basin of the continent. The specimen which reached the laboratory had the appearance of a bulbous root which had been subjected to the action of heat till it was quite soft. Mr. Johnson describes the plant as belonging to the genus *Yucca*, and as growing abundantly in dry rocky soils. We regret that we are not able to obtain the root in its fresh state, for in its roasted condition, both the starch and true sugar would probably appear as glucose, or fruit sugar, in the analysis. After subjecting the sample to a temperature of

100° C. for forty-eight hours, it gave the following results on proximate analysis:

Glucose, (fruit sugar) .....	7.3828
Albuminoid matter.....	0.2168
Woody fiber and cellular tissue.....	92.4004
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	100.0000
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The composition of the root will probably vary with the season of the year, and perhaps with the soil in which it grows.

Three samples of sumac leaves were sent to the Department, in which it was required to determine the amount of tannin. No. 1 is sumac (so called) grown upon elevated, dry lands, near Campo, San Diego, California, and No. 2 grew upon low, moist land in the same locality. These samples were sent by A. M. Gass. A third sample (No. 3) was sent by Mr. Clarke Irvine, from Oregon, Holt County, Missouri.

The analyses resulted as follows:

No. 1.	
Tannic acid.....	13.1
Woody fiber, cellular tissue.....	86.9
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	100.0
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No. 2.	
Tannic acid .....	7.92
Woody fiber, &c.....	92.08
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	100.00
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No. 3.	
Tannic acid.....	28.075
Woody fiber, &c.....	76.925
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	100.000
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Samples No. 1 and No. 2 were collected at different times in the season, with a view to determine the best time in the season to collect them, or, in other words, to determine at what point in the development of the leaves they contain the largest amount of tannic acid. We were unable to make any determination of this kind, however, since, as we have intimated above, we had some doubts as to whether they were leaves of the same species of plants, and indeed whether they were true sumac. We therefore consulted the botanist of the Department, who reported upon them as follows:

The specimens of leaves marked No. 1 are undoubtedly those of *Styphonia integrifolia*, Nutt. A small tree growing near the sea-coast in Southern California, and forming dense thickets. It belongs to the same natural order\* (*Aniardiaceae*) as the sumacs, but differs from them in several particulars. It does not have the pinnate leaves which characterize most of the sumacs, but its leaves are simple, thick, and leathery, one to two inches long. The bark is said to exude an astringent resinous gum.

The leaves marked No. 2 are too much broken up for identification, but are evidently not of the same species as No. 1.

The sample from Missouri is *Rhus glabra*, or true sumac, and contains a fair percentage of tannic acid.

SCIENTIFIC NOTES.—*Sulphur*.—The use of sulphur to destroy parasitic growths, both animal and vegetable, is of high antiquity and of almost universal adoption; but just how sulphur operates in producing the marked results which commonly follow its use is a question which



has been but little discussed. At a late meeting of the Royal Horticultural Society at Birmingham, England, a paper was read by Charles Roberts, F. R. C. S., introducing the discussion of sulphur and its mode of action on the lower forms of life, in a manner which promises to throw much light on an occult subject. Mr. Roberts' chief argument is directed to the proof of the proposition that the effects are not produced by sulphur, as such, but by its lowest combination with oxygen—sulphurous acid, or, as he names its gaseous form, *sulphozone*. Pure sulphur is insoluble in water, and therefore cannot act chemically on organisms, whether animal or vegetable; and there is nothing in its physical form that would enable it to act mechanically in a manner injurious to life. This conclusion was reached from careful and often-repeated series of experiments by which it was demonstrated that sulphur, thoroughly purified from all traces of sulphurous acid by repeated washings, is utterly ineffectual in destroying mildew or other organisms, and that seeds germinate as readily in such sulphur as in sand. Pure washed sulphur, mixed with a little flour and moistened with water, covers its surface with mold in a few days, if kept at a favorable temperature; and cheese mites live and multiply indefinitely in cheese covered with pure sulphur. These results were all reversed when the common flowers of sulphur were used. This always contains an appreciable amount of sulphurous acid. Prosecuting this line of experiment, it appears that the efficiency of sulphur, in any form in which it is used to destroy or prevent fungoid or parasitic growths, depends entirely on the quantity of sulphurous acid present. Charcoal, and many other substances capable of absorbing and retaining gaseous sulphurous acid, is, when thus impregnated; as effectual as sulphur in destroying mildew and kindred organisms.

In the light of these facts, Mr. Roberts adds: "From my experiments and observations, and from the well-known properties of sulphurous acid, I conclude, therefore, that it is the acid, accidentally present in the sulphur, which is the active agent in the destruction of mildews and blights, and that the sulphur is only the medium for its application." The acid may be dissolved in water, as well as absorbed by porous bodies other than sulphur, and thus furnish a very convenient form for its use in the destruction of parasitic growths. For horticultural purposes, however, a precaution will be necessary in using solutions of sulphurous acid, to limit the strength of the solution, lest in destroying parasites the remedy may prove destructive to the plants also. As some plants will endure a much more concentrated solution than others, the proper strength adapted to any given case must be left to the judgment of the gardener.

In addition to its power over vital forms and forces, sulphurous acid exerts a notable chemical action on dead animal and vegetable matter, suspending, to some extent, the usual process of decay and dissolution, and destroying or modifying emanations from persons suffering under infectious diseases. It is, therefore, a most potent and valuable disinfectant. How sulphurous acid operates to produce its effects both on the life and form of organisms is a question that opens a field to the physiological chemist which has been but little explored.

**Welding copper.**—The Journal of the Franklin Institute says that Mr. Rust has succeeded in perfecting a method by which he accomplishes a most perfect welding of copper. He mixes together 358 parts of phosphate of soda and 124 parts of boracic acid. This powder is applied when the metal is at a low red heat; it is then brought to a cherry-red and at once hammered. A wooden hammer is recommended.

*Zinc labels.*—In nurseries and horticultural establishments generally it is necessary to attach labels to the different specimens, and when these are exposed to the weather the writing on the label becomes illegible in a few years, and if care is not taken to renew it, the inscription will be lost. These labels are commonly made of wood, and the inscription put on with a plumbago pencil. Sheet-zinc cut into any convenient form and attached either by a slender point cut to the label, or by a fine copper wire, is the best material for labels. A special ink for the inscription may be made by taking one part each of acetate of copper and chloride of ammonium, and half a part of lampblack, and mix these with ten parts of water. Keep it in a glass bottle with a ground-glass stopper. Shake well before using, and write with a coarse steel pen. The writing will resist the action of the weather for years.

*Artificial marble.*—The manufacture of artificial stone is daily becoming more important, as the demand for the article increases, and new processes are being introduced constantly, looking both to the durability and beauty of the products. The latest of these is the manufacture of artificial marble by Signor Raccotti, in London, England. It is said to be very beautiful, and to cost but one-tenth the price of natural marble.

*Artificial butter.*—A commission, created by the victualing department of the navy of France, reports a process for the artificial production of butter, of which it is affirmed that it will not become rancid by age. The following is the process of manufacture recommended:

Best fresh beef-suet is first mechanically cut by means of circular saws fitted to a cylinder, and is next placed in a vessel containing water, carbonate of potassa, and fresh sheeps' stomachs previously cut up into small fragments. The temperature of this mixture having been raised to 45° C., (112° F.,) the joint influence of the pepsine from the stomachs, and heat causes the fat to be separated from the cellular tissue; the fatty matter floating on the top is decanted, and, after cooling, submitted to very powerful hydraulic pressure; the stearine is used in candle-making and the semi-fluid oleo-margarine is used for making the artificial butter in the following manner: 50 kilograms of the fat are poured, along with 25 liters of milk and 20 liters of water, into a churn, while there is added 100 grams of the soluble matter obtained by soaking some hours in milk from cows' udders and milk glands; a small quantity of annatto is also added, and the process of churning is proceeded with. The butter thus obtained is well washed with cold water.

*Potassium—by a new method.*—To procure the alkaline metals, potassium and sodium, readily and cheaply, is a desideratum, not so much on their own account as on account of the relation which these metals sustain to the manufacture of aluminium. Professor A. E. Dolbear produces potassium by heating the sulphide of that metal, in an alembic, to a bright red heat, in contact with iron filings, when the metal distills over and is received in common coal-oil. The chemical reaction is a very interesting one, though very simple. The sulphide of potassium at a high temperature yields its sulphur to the iron filings, and the potassium, thus abandoned, passes over as a vapor, and is condensed and received under naphtha, or any other hydrocarbon fluid. Whether this process will cheapen the alkaline metals, remains yet to be tested. It is not probable that we will ever be able to obtain aluminium by a direct process from its oxide, and as long as metallic sodium, or potassium, is indispensable in the production of aluminium, that important metal will correspond in price to the alkaline metals, by the agency of which alone it can be obtained.

*Phosphoric acid.*—The occurrence of phosphorus in combination with the ores of iron, whether as phosphides or phosphates of that metal, has long been an annoyance to iron manufacturers, and many rich ores are rendered worthless by the presence of phosphorus, rendering the iron



brittle and worthless. Julius Jacobi (in *Bayerischer Industrié und Gewerbeblatt*) proposes a method of freeing iron ores from phosphorus, and at the same time saving the phosphoric products and economizing them for agricultural purposes. His process consists in roasting the ore and crushing it, and, after placing it in a proper receiver, submitting it to the action of water charged with sulphurous acid under pressure. The ore is then washed with water to remove all the soluble products, and the phosphoric acid precipitated from the water with fresh burnt lime, and the phosphoric acid obtained as a neutral phosphate of lime. If the process is effectual, and not too expensive, the proposed method is very important, as rendering many ores available which are now regarded as worthless, and at the same time supplying a demand in agriculture which has heretofore been but imperfectly met. If the sulphurous acid can be furnished from the ores themselves, in the process of roasting, it will go far in reducing the expense.

*The Osage orange.*—The *Maclura aurantica* has become a familiar shrub in most parts of the United States, from its general use as a hedge-plant; but it is now proposed to utilize the Osage orange for other purposes. A decoction of the wood is said to yield a beautiful and very permanent yellow dye, and this decoction, carefully evaporated, forms a bright yellow extract called aurantine, which may be used in imparting its color to fabrics. In addition to this coloring-matter, the wood of the Osage orange is rich in tannin. Experiments made in Texas represent that hides are tanned quicker with the wood of this tree than with oak bark. The seeds yield a bland, limpid oil, resembling olive-oil, and which may, in general use, be substituted for it.

*Effect of atmospheric pressure.*—Mr. Paul Best, (Les Moudes, July 11,) in a very interesting memoir, shows that the destruction of life by diminished barometric pressure is chiefly to be attributed to deficiency of oxygen. An animal that will die with the pressure reduced to 18 centimeters (7 inches) of mercury, will endure a reduction to 6 centimeters (2.4 inches) if an additional supply of oxygen be furnished. And the converse is also true, that the danger of too great pressure is from the increased amount of oxygen in a given volume of air inhaled.

*Topographical measurements in the West.*—Professor C. Thomas, assistant of Dr. Hayden, United States geologist, has compiled and published a series of tables giving important data with regard to the Rocky Mountain regions and the great plateau of the West. The southern portion of the great American plain, the *Llano Estacado*, has an average elevation of about 4,000 feet above the sea. The ascent from Preston to the margin of the Staked Plains is about 10 feet to the mile, and from Fort Smith to the northern margin of the plains the ascent is 6 feet to the mile. From Kansas City to Denver Junction the ascending grade is a little more than 8 feet to the mile. From Omaha to Cheyenne the grade ascends just 10 feet per mile. The ascent from Fort Union at the mouth of the Yellowstone to Fort Benton is only about 2½ feet per mile, while from that point west to the base of the mountains, the average ascent reaches 20 feet to the mile. The plateau which lies between the Black Hills and the Wahsatch range of mountains has an elevation of about 6,500 feet above the sea, 1,200 feet above the western border of the plains, and 2,200 feet above the Salt Lake basin.

The Rio Grande, from Isleta to El Paso, has a fall of about 5 feet to the mile, but from Isleta south for some distance its descent is 6 feet per mile. The Canadian, from the mouth of Pajarito Creek, for two hundred



miles eastward, descends at the rate of 9 feet per mile. The Arkansas, from the mouth of the Apishpa to Fort Atkinson, has a fall of between 8 and 9 feet to the mile. The descent of the North Platte, from Fort Fetterman to its junction with the South Platte, is 7 feet, and the South Platte, from Denver to the junction, is between 9 and 10 feet per mile. The fall of Snake River from the mouth of Ross's Fork, north, is about 6 feet to the mile. These figures show the practicability of distributing the water of these streams over the plains for the purpose of irrigation.

Of mountains, we have six in these tables whose summits rise above 14,000 feet. These are: Mount Harvard, 14,270; Pike's Peak, 14,216; Gray's Peak, 14,145; Mount Lincoln, 14,123; Mount Yale, 14,078; Long's Peak, 14,056. These measurements furnish data for conclusions, both curious and important, connected with the study of climatology and the adaptation of the "Great American Desert" to agriculture, stock-raising, &c.

*Preserving action of boracic acid.*—It has been found that boracic acid has a preservative action upon milk and beer, and it is stated that one gram added to a quart of milk keeps it sweet and fresh in hot summer weather for one hundred and twenty hours, while milk not treated in this way will become sour in thirty-six hours. The addition of boracic acid to milk does not injure it for use, but the cream is separated far more slowly.

*Spontaneous combustion of wood.*—A certain French writer gives an account of the spontaneous combustion of a wooden beam in a building at Ribemont, (Aisne.) The beam was exposed to the direct rays of the sun, and during one of the hot days of summer it was found to be on fire. the combustion proceeded slowly but was quite distinct, and emitted a smoke which had a curious appearance, and on blowing on the wood it burst into a flame. It is asserted that the fire was due to the heat of the sun alone.

*Chemical constitution of tannic acid.*—The doubtful character of the chemical constitution of tannic acid has led to some very interesting investigations. Doctor Schiff has lately come to the conclusion that it is an alcoholic anhydride of gallic acid, or di-gallic acid. In other words, he considers that it is an ether which bears the same relation to gallic acid as ordinary ether does to alcohol. Since, therefore, gallic acid differs from tannic acid merely in the elements of water, the discovery of some method by which these elements could be displaced might lead to some practical results with regard to the processes of tanning.

*The value of girondin as a disinfectant.*—The prevalence of disease in many of our large cities, due in a great measure to the filthy condition of the streets, shows the necessity of having some effectual disinfectant. To this end the board of health in New York City has made a series of experiments upon the value of all the disinfectants in the market, and decided that girondin, a French invention, is the most effectual. It is due to the use of this article, as is claimed, that the city has been kept free from epidemic during the past two years.

*Test for silk goods.*—If a sample of silk goods suspected to contain other kinds of fiber be treated with hydrochloric acid of 1.13 specific gravity the silk will be dissolved, while other kinds of fiber, such as jute and linen, will remain undissolved.

*Preservation of wood.*—F. Sieburger states that the inconveniences of the application of chloride of zinc and so-called water-glass solution, for

the preservation of wood, may be avoided by first washing the wood with a hot and saturated solution of three parts alum and one part sulphate of iron, and afterward with a more dilute solution of sulphate of iron, to which a sufficient quantity of fire-clay has been added to make it as thick as ordinary paint. Another method is as follows: The wood is repeatedly painted over with a hot solution of glue, until a very thin coat of glue remains upon the surface, the wood is then painted over with a thicker solution of glue and a mixture of one part of sulphur, one part of ochre or pipe-clay, and six parts sulphate of iron is applied with a dredger, the ingredients having been first pulverized and thoroughly mixed.

*Sensitive streams.*—Professor Edwin J. Houston, while spending a summer's vacation in Pike County, Pennsylvania, had the good fortune to discover the sensitiveness of water to sound waves. Among the many beautiful waterfalls of that section he found one scantily supplied with water which dripped in small streams from the ends of the moss covering the rocks of the precipice; the air being still and the stream free from ventral segments. And it was found that on sounding a shrill falsetto note the streams would instantly respond, and change the grouping of the drops and the position of the ventral segments. A heavy rain, however, flooded the stream and prevented further investigation.

*Dyeing veneer wood.*—C. Méne recommends that the wood be steeped for twenty-four hours in a solution of caustic soda and boiled with it for one-half hour. After washing to remove all the lye it will be found to have become as soft as leather, and equally as plastic, and to be in an excellent condition to absorb the dye stuffs. The dyes are fast and thoroughly penetrate the wood, which after drying may be sawed and veneered.

## BOTANICAL NOTES.

BY GEO. VASEY, BOTANIST.

**CURIOUS PHENOMENON IN VEGETABLE PHYSIOLOGY.**—It has long been known to botanists that, occasionally, after the felling of pine and fir trees, their stumps would continue to increase in diameter, *i. e.*, form new woody layers for several years. Dutrochet mentions some cases of extraordinary longevity in the stock of *pinus picea* after the trunk had been felled. He says that in the year 1836 a stock of *pinus picea* felled in 1821 was still alive, and had formed fourteen thin new layers of wood, that is one each year; and another, felled in 1743, was still in full vegetation, having formed ninety-two thin layers of wood, or one each year. This singular phenomenon was long a puzzle to botanists and vegetable physiologists. Over thirty years ago Goeppert, an accomplished botanist of Breslau, undertook an investigation of the subject. The result is published at large in the *Annales des Sciences Naturelles* for 1843. It appears that in all the cases examined by Goeppert there was a union of the roots of the fallen trees with the roots of living trees growing in the immediate vicinity, and his explanation of the phenomenon was that the stumps maintained their growth by drawing their supplies of sap from the trees with which they were thus con-

nected. The union of roots in these cases was sometimes woody and sometimes only by the bark of the roots. So far as observed this anastomosis or natural grafting is confined to coniferous trees, and to only a few species of them, chiefly the silver fir, the spruce, and occasionally the Scotch fir. In the London Gardeners' Chronicle of August 31 is an account of an instance of this kind of anastomosis of the roots of a larch, and a figure is given of the specimen, in which the stump and its root connections are exhibited. The cut stump shows rotten wood in the center, with the new wood at the circumference surging over the edges of the wound.

Although the discovery of this root union explains some of the questions involved in this curious phenomenon, it does not explain them all; for instance, why does not the sap, which is thus robbed from the roots of the nurse tree, pass up in the usual channels and overflow at the top of the stump, as is the case when a grape-vine or deciduous tree is cut during the active ascent of the sap? As the growth of new wood in exogenous trees takes place from the cambium, and the cambium is supposed to be the sap which has been elaborated in the leaves, what is the source of the cambium in these stumps?

It would seem as if there was here a complete contradiction of the ingenious theory of some of the French botanists, that wood growth begins in the leaves or leaf-buds and descends continuously from thence to the roots, so that in fact wood may be considered the united mass of roots which emanate from the leaves of the plant.

The theory of De Candolle is that the woody and cortical layers originate *laterally* in the cambium furnished by pre-existing layers and nourished by the descending sap. To use the words of De Candolle, "The whole question may be reduced to this: either there descend from the top of a tree the rudiments of fibers which are nourished and developed by the juices springing *laterally* from the body of the wood and bark, or new layers are developed by pre-existing layers which are nourished by the descending juices formed in the leaves." The latter part of this statement, though somewhat vague and unsatisfactory, probably involves the true theory of the formation of wood. The *pre-existing layers* mentioned in De Candolle's statement include the medullary rays which reach the circumference. These medullary rays are composed of cellular tissue derived from the pith, and, like it, are capable of indefinite extension by cell multiplication.

The primary state of all the tissues of the plant is the condition of simple cells, each of which is in a certain sense an independent body, having its own life-work and history in the complicated mass of which the tree is composed. All extension of the tree in any direction is made through the medium of cell-growth and cell-modifications, and wherever there is cellular tissue in a state of vitality there may be cell-multiplication whenever material for growth, *i. e.*, sap in different stages, is brought into contact with such tissue.

In the case of the pine stumps alluded to, the medullary rays of the recent wood retain their vitality, and when the sap rises it is transmitted through these rays and through the interspaces of the woody matter, to the surface beneath the bark, these being appropriated to the organization of new cells whose walls are thickened by continuous secondary deposits, as in the normal formation of woody tissue. Of course the amount of this woody formation will be limited, from the deficient supply of sap and the want of concentration which it would obtain by passing through the leaves.



RURAL ADORNMENT.—Nothing contributes more to the appreciation of a rural home than its surroundings. Nothing is more seriously missed by the early settlers in a new country, especially by the female members of a household, than the shrubs and flowers which they have left behind them in their early homes. How many a heart has longed for the familiar lilac-bush with its early, handsome, and fragrant clusters of flowers. What sweet memories of the ever-pleasing and beautiful rose-bush; or of the old-fashioned snow-ball, with its masses of snowy flowers contrasting so finely with its dark green foliage; or the modest, unobtrusive little wax-bush with its pearly blossoms, and in due time its strings of 'snow-white berries which refuse to drop from the slender twigs long after the frost has stripped the green leaves.

Notwithstanding the absence of these and many other memory-honored shrubs and flowers in the frontier homes, very much may be done to substitute for them native plants of perhaps equal value. There is a patch of wood not many miles distant from any settler where some shrubs may be procured which will relieve the garden or yard of its nakedness, and lend beauty and attraction, perhaps quite equal to those favorites which are now beyond reach. The kind of such shrubs will, of course, vary in different localities.

South of latitude 40° few western woods are destitute of the flowering dogwood, *Cornus florida*, and the red-bud, *Cercis canadensis*, two shrubs which flower in company in early spring, and present the greatest contrast of color, the one a pure white, and the other a perfect blaze of scarlet; one to be succeeded by bright red berries, which last until winter, the other by clusters of long pods which hang gracefully beneath the leaves, and still persist when autumn has bared the branches of their handsome heart-shaped leaves. In localities where these cannot be procured their places may be supplied with several of the smaller kinds of dogwood which abound in every forest, or with some of the *riburnums* which are equally common, and form attractive shrubs, some of them with rather showy berries.

The wahoo, *Euonymus atropurpureus*, with its small dark purple flowers, is very showy in autumn when loaded with its curious crimson pods. Smaller ornamental shrubs may be found in most localities. Among these we may mention the shrubby johnswort, *Hypericum prolificum*, which furnishes an abundance of rich yellow panicles, or in northern localities its place may be supplied by the equally handsome shrubby cinquefoil, *Potentilla fruticosa*.

Nor need our lady friends be wholly without roses. South of latitude 40°, in rich bottom lands, the climbing rose, *Rosa setigera*, parent of several beautiful cultivated varieties, is abundant, and will show its appreciation of the kind hand which shall transplant it to the warm side of a cottage, by sending up amazingly vigorous shoots, which, in a few years, will perfectly embower and beautify the home.

Farther north the swamp-rose, *Rosa Carolina*, or even the early wild rose of the prairies and hills, *Rosa blanda*, will well repay cultivation.

The variety of shrubs may be further increased by the wild hydrangea, which is sometimes nearly equal to its exotic relative, and is much more hardy; also, by several species of spirea, particularly *Spirea opulifolia* and *Spirea salicifolia*, which is extremely common in rich lowlands everywhere.

The wax-bush, or snowberry, *Symphoricarpus racemosus*, is native in some portions of Wisconsin and Minnesota, where it is also accompanied by an allied species, the wolf-berry, *S. occidentalis*, which has larger flowers and very similar white berries; while more southward, in Illi-

nois, Iowa, Missouri, and Kansas, may be found another species of the genus *S. vulgaris*, called Indian currant, or coral berry; and whoever transplants a bush of this kind into the garden will find it to become a favorite.

Of climbing vines for covering porches or arbors, our most valuable kinds may be found in almost every thicket in the country; particularly, we may mention the Virginia creeper, or American ivy, *Ampelopsis quinquefolia*, which may be distinguished from the poison ivy, *Rhus toxicodendron*, by having its leaflets in fives, while the latter has them in threes. South of the fortieth parallel the beautiful trumpet creeper, *Tecoma radicans*, is abundant in rich bottoms, and, with a very little care in transplanting, will soon make a splendid display of its large and showy trumpet-shaped flowers. Farther north the less pretentious and modest virgin's bower, *Clematis virginiana*, with its conspicuous silky tufts of fruit, will furnish a handsome ornament for bower or porch.

AMERICAN PLANTS IN GREAT BRITAIN.—An English journal says: "The beautiful *Asclepias tuberosa* is, this season, producing freely its showy, bright orange-colored flowers in several collections round London. This fine perennial thrives perfectly well almost anywhere, if planted in sandy peat." In the same journal we find the following: "One of the best hardy aquatic plants in flower at the present time is the North American pickerel weed, *Pontederia cordata*, a plant by no means so often met with as it deserves to be. It produces a stout spike of handsome sky-blue flowers from 1½ to 2 feet high. No ornamental water should be without this charming aquatic, which should, however, have a place near its margin."

Again: "The American pitcher plant, *Sarracenia purpurea*, is thriving as well as any native plant in the bog-garden in Messrs. Backhouse's nurseries at York, and by its side a healthy little specimen of the still more curious *Darlingtonia Californica* is beginning to grow freely."

The above extracts will show that many of our native plants find a better appreciation in foreign cultivation than they do in their own country. It is to be hoped that our gardeners and florists will give more attention to the introduction of native plants whose merits have been overlooked because of their commonness.

## MICROSCOPIC INVESTIGATIONS.

BY THOMAS TAYLOR, MICROSCOPIST.

ONION BLIGHT AND SMUT.—About the middle of August last, I was invited by Mr. Benjamin P. Ware, of Swampscott, Massachusetts, to inspect a field near his farm, consisting of four acres of onions, which were badly blighted with fungi. The ground had been cultivated in the usual manner, and prime seed was used. At an early stage of their growth it was discovered that the onion fungus had diffused itself so generally over the field that it was deemed useless to cultivate it further. In the plot we found remnants of the crop, but very few onions had escaped the blight. The crop was practically consumed, causing a loss to the proprietor of about \$2,000. I selected a few specimens of the blighted onions for experiment. The blight is first observed at the base of the leaves as a white mold, which ultimately spreads over the bulb, gradually blackening the surface, and penetrating through the



layers. When a portion of the white mold found on the leaf is transferred to a microscopic slide, and viewed by a power of about one-eighth, it appears as at 1, Fig. 18. The spores seen on the ends of

FIG. 18.



the branches are compound, and when moistened, resolve themselves instantly into separate sections (2.) When the mold is matured, viewed by a power of about 75 diameters, it appears double-fruited, as at 5 and 6. It is believed by the farmers at Swampscott, that dry weather favors the growth of the white mold, but that moist and rainy weather favors the growth of the black fungus, or rot, which is seen mostly on the bulb of the onion. When the black spores are viewed by a power of about one-eighth, they appear of a rosette form, (3,) each resembling a combination of cells, encircling a common

center. Figure 19 represents at 7 a highly magnified view of a portion of the leaf of a mildewed onion; 8, a chain of elliptical spores, which grow in great profusion over it, when the leaf is kept in a moist condition for a few days; 9 shows stomates of the leaf from which thread-like mold, mycelium, is seen to proceed, proving that the fungus has ramifications under the epidermis, and doubtless through the intercellular spaces, if not through the cellular substance itself, from which the fungoid threads draw nourishment for the support of their fruit, &c. I subjected the black spores (3) to the action of concentrated nitric, nitro-muriatic, and sulphuric acids, caustic, potash, and lime, for twenty-four hours, without effecting any change in structure. When immersed eight days in nitro-muriatic acid, the spores become slightly bleached, and appear as at 4. When immersed in heavy oil of tar, which contains a large portion of carbolic acid, their structure is materially changed.

In an address delivered by Mr. Ware before the Essex Agricultural Society, at Newburyport, September 29, 1869, he said that "The onion blight and smut is at times very destructive to the onion crop, turning the most promising fields in a few days to scenes of desolation, which is caused, in my opinion, by a parasitic plant, growing upon and consuming the vitality of the onion. The onion smut so impregnates the land with its spores, as to render it unsafe to plant onions for several years on land thus affected. White blight comes upon the crop at the period of its most vigorous growth, in a dry time, showing its effect perhaps in a small spot at first, but, in case the dry atmosphere continues, rapidly spreading over the whole field. Two or three days give sufficient time to stop entirely all future growth of the crop, unless a change in the weather occurs unfavorable to the growth of the parasite."

When an onion affected with fungus is placed in a vessel with a few drops of water and exposed to a temperature of about 75°, its decay is hastened very materially, but apparently more from the presence of infusorial life than from the parasitic fungi. The latter seem to prepare



the way for a species of angulula, which appear in great numbers monads, water-mites, vibrions and bacteria, by breaking up the proximate elements. These being destroyed, or changed in composition, a watery juice is always formed where the fungi rested. Whenever the conditions are favorable for aquatic life, it appears in profusion. Torula, a low form of fungi budding-cells, set in, causing fermentation, and assisting in the general destruction of the onion. This explains the cause of its rapid decay in the field, when once attacked by "mildew and smut," under high temperature and moisture.

Moisture, and a temperature of about 70°, seem to have the effect of changing the sectional spores from their original appearance, as repre-

sented in Fig. 18, 2, to that in Fig. 19, 10, in which a greater number of divisions is observed, containing sometimes as many as eleven cells, and all containing slightly elliptical spores. To ascertain the true course of the transformation of the onion-blight and smut will require further observations; but I think it probable that the so-called smut is but a higher stage of the secondary globular yellow fruit seen on the mycelium. See Fig. 18, 6. The micro-chemical observations made fully sustain the views of the onion-growers, viz, that the onion-smut is very tenacious of life.



FIG. 19.

In many localities, rank weeds might be procured in great abundance on fields infested by the fungi, (on the field alluded to, weeds three feet in height grew in profusion;) were they cut down, sun-dried, spread over the field, and with them brushwood and all useless materials found about the farm burned, the surface-spores, and all germs of parasitic life within reach, would be consumed, and caustic potash, lime, and charcoal would be liberated and diffused over the field for the benefit of the succeeding crops.

## THE COTTON MOVEMENT.

The New York Cotton Exchange presents the following figures as the sum of receipts of cotton, (in bales, which average about 465 pounds,) and the shipments to foreign countries, during two years past, the commercial year ending September 1, and covering substantially, though not exactly, the crop of the preceding calendar year :

	Commercial movement.	Exports.
Crop of 1870.....	4,347,006.	3,169,009
Crop of 1871.....	2,974,351.	1,957,314

Of this movement of the past year, the receipts of New York amount to 724,615 bales; those of New Orleans, 1,079,129.

The interior and local movement, in detail, is thus given :

	Receipts.		Exports.		Stocks on September 1.	
	1870-'71.	1871-'72.	1870-'71.	1871-'72.	1871.	1872.
Galveston.....	294,452	179,612	217,537	116,583	10,490	5,115
New Orleans.....	1,427,588	940,211	1,293,321	891,776	25,323	6,218
Mobile.....	400,978	286,066	287,006	140,045	5,466	960
Savannah.....	734,243	457,159	467,050	295,909	3,215	844
Charleston.....	354,704	273,767	174,665	108,856	3,443	2,825
New York.....	522,186	127,272	679,629	370,964	38,875	18,939
Florida.....	10,754					
Boston, Baltimore, Norfolk, &c.....	212,918	418,599	49,793	30,862	12,238	13,993
	3,957,823	2,682,686				
Overland, southern consumption and corrections.....	389,183	291,665		Cor.2,319		
Total.....	4,347,006	2,974,351	3,169,009	1,957,314	99,040	48,899

The total movement and home consumption of our cotton for seven years past is thus given on the same authority:

Year.	Commercial crop.	Total crop.	Consumed north.	Consumed elsewhere.
1871-'72.....	2,854,351	2,974,351	977,540	129,000
1870-'71.....	4,255,766	4,347,006	1,072,426	91,240
1869-'70.....	3,034,749	3,114,592	777,341	79,843
1868-'69.....	2,260,567	2,433,770	821,924	173,203
1867-'68.....	2,430,893	2,599,241	799,817	165,348
1866-'67.....	1,951,983	2,232,660	573,367	280,672
1865-'66.....	2,151,043	2,277,683	510,652	126,640
1860-'61.....	3,656,086	3,849,469	650,357	193,383
1859-'60.....	4,675,770	4,861,292	792,521	185,522
1858-'59.....	3,851,481	4,018,914	760,218	167,433
1857-'58.....	3,113,962	3,257,339	452,185	143,377
1856-'57.....	2,939,519	3,093,737	665,718	154,218
1855-'56.....	3,527,845	3,665,557	633,027	137,712
1854-'55.....	2,847,339	2,982,634	571,117	135,295
1853-'54.....	2,930,027	3,074,979	592,284	144,952
1852-'53.....	3,262,882	3,416,214	650,393	153,332
1851-'52.....	3,015,029	3,126,310	588,322	111,281

## CO-OPERATIVE DAIRIES IN SWEDEN.

The following statement of the extension of the distinctively American idea of associated effort in dairying, is from the German of E. de Salviatte, secretary of the state board of agriculture of Prussia, translated for the Department of Agriculture by A. W. Angerer, of the Bureau of Statistics of the Treasury Department :

The success gained by the cheese-associations in Switzerland, and by a few similar establishments in Southwestern Germany, as well as by farming associations in North America, has led to the formation of milk-associations in England, especially in Derby. They have demonstrated that, under certain conditions, the manufacture from milk on a large scale, extended over a considerable area, must have many advantages over individual enterprise. In Sweden, also, these associations have been formed, and the first report of the dairy stock association of Stockholm coincides with the first annual account of the milk association in Derby.

The advantages claimed by the committee of the milk association are in part the

same which support this enterprise in Sweden, only substituting butter for cheese; for here the first objects of manufacture were butter and cheese, while the making of cheese has latterly been confided to single producers, making butter the chief production of the association. The report of the British association points out the following advantages:

1. Milk in large quantities, in the preparation of Cheddar cheese, yields a much larger amount of curd than small quantities.
2. The expenditures for wages are proportionally much smaller in a large industry, and may be reduced to a minimum.
3. The advantage in cheap implements and buildings is very considerable.
4. The loss of raw materials is far less in a large factory. Less milk yields more cheese.
5. The loss in handling the cheese prepared, but yet unmaturred, is proportionately much larger in small establishments.
6. Everything pertaining to the cheese manufacture on a large scale admits of savings, in the manner of working up the raw materials.

Before the present stock association was formed in Sweden, there existed already a large dairy established by Mr. Lidholm, which transformed into milk and butter 6,000 cans (41.48 gallons, United States,) of milk per day, the products being shipped by railroad in winter and by steamship in summer, to the capital. This establishment has been incorporated by the present stock association, which was chartered by law of October 1, 1870, with a capital stock of 1,000,000 Swedish dollars, (\$275,600,) of which thus far 350,000 Swedish dollars (\$93,460) have been issued.

Very soon the company found it of advantage, instead of the milk in its natural state, to purchase the cream separate, in order to give chief attention to the manufacture of butter. Agents concluded contracts with large milk producers for delivery of the cream, and the farmer soon discovered that the cream, while the skimmed milk would be profitable at home as food for young cattle and swine, yielding them thirty-two oere per can, (or 12.876 cents, gold, per gallon, United States,) instead of twenty oere (7.9 cents, gold, per gallon, United States) per can as before.

The quantities of milk purchased through the agents during the first quarter of the operations was 326,144 cans, (225,490 gallons, United States,) and from the report appears that the production of 1 can of cream required 7.1 cans of milk, and as the above quantity of milk yielded 50,620 pounds of butter, it averaged 6.3 cans of milk to 1 pound of butter, (4.616 gallons, United States, of milk to 1 pound, United States, of butter.) The production of fresh cheese required 1.88 cans of milk for one pound, (1.386 gallons, United States, per pound, United States.)

From these facts the conclusion is drawn that the result is not favorable as regards the yield of butter, but very satisfactory as regards the yield of cheese, which clearly proves that the cream formation was imperfect and that a good portion of the butter contained in the milk passed into the cheese. The chief cause of this the report ascribes to the fact that, in October and November, the depots receiving the milk were short of ice and could not keep sufficiently cool the temperature of the water vessel in which the formation of cream takes place. Beyond the cream realized from the milk purchased, the quantities directly obtained were: October, 24,917 cans; November, 27,288 cans; December, 25,900 cans; January, 31,590 cans; February, 31,640 cans.

The price paid for milk varied with the season and locality, from 16 to 22 oere per can, (6.36 to 8.77 cents, gold, per gallon, United States,) the average being about 19 oere per can, (7.57 cents, gold, per gallon, United States.) For cream was paid, in October, 80 oere per pound of butter realized therefrom, (23.53 cents, gold, per pound, United States;) in November and December, 85 oere per pound, (25.02 cents, gold, per pound, United States,) and during the first months of this year 90 oere per pound, (25.47 cents, gold, per pound, United States.) In these first transactions the company aimed at profits of one oere per can (0.0386 cent, gold, per gallon, United States) of milk, and 5 oere per pound (1.47 cents, gold, per pound, United States) of butter.

According to their first charter the association could extend its operations in a limited district only; but a decree of May 12, 1871, removed this limitation, and soon they formed ten branch establishments. The total production of butter was, (in Swedish pounds:)

	October. 1870.	November. 1870.	December. 1870.	January. 1871.	February. 1871.
Stockholm.....	32,235.88	36,581.00	35,822.05	44,115.45	45,037.80
Nyköping.....		315.10	1,603.40	233.17	3,146.70
Eskilstuna.....		490.00	7,047.20	10,547.55	11,876.18
Örebro.....			1,663.70	6,526.22	13,234.17
Total.....	32,235.88	37,305.10	46,136.35	63,523.39	73,294.85



From October to December, cheese to the number of 1,297, weighing 45,045 pounds, was manufactured in fourteen locations. Of butter-milk was obtained, (Swedish cans:)

	October.	November.	December.	January.	February.
Stockholm.....	19,018	22,400	22,600	25,265	23,655
Nyköping.....		224	786	1,382	1,719
Oerebro.....			556	2,211	5,085

Regarding the prices obtained for their products, the Stockholm association publishes the following current rates in their competition with others in the London market. The figures are in shillings per hundred-weight, (112 pounds:)

Date.	Stockholm associa- tion.			Norman.	Dutch.	Irish.					
	First.	Second.	Third.			Table-butter.			Ordinary.		
						First.	Second.	Third.	First.	Second.	Third.
November 24 .....	136			140	134	134	124	118	130	120	112
December 2 .....	140	138		154	140	138	127	117	130	123	110
December 7 .....	140										
December 14 .....	140				140	148	130	118	130	123	113
December 21 .....	140	130	112		140-154	152	130	120	138	126	114
January 3 .....	150	140			150	152	146	130	146		132
January 17 .....	152	144	120		150	152	146	130	146	140	121
January 31 .....	156	146-50	130								
March 20 .....	152	140		160	150	150	150	140	148	148	126

The establishment at Stockholm, sold to inland customers in October 1,448.50 pounds; in November, 1,447.50 pounds; in December, 1,716.25 pounds; January, 1,981.50 pounds; February, 1,875 pounds of butter. The maturing of cheese requires, in general, six months; a small part of the production only had been sold at 21 oere per pound.

From the Stockholm establishment cheese was sold: October, 7,700 pounds; November, 8,800 pounds; December, 11,420 pounds; January, 11,052 pounds; February, 12,576 pounds.

By contract the establishment furnished on every week-day 2,000 cans, (1,382.7 gallons, United States;) on each Sunday, 1,200 cans (829.6 gallons, United States) of skimmed milk, at 14 oere per can, (5.58 cents per gallon, United States,) and all butter-milk obtained at 7½ oere per can, (7.82 cents per gallon, United States.)

The whey from the manufacture of cheese, as far as not fed to the swine owned by the establishment, was disposed of at 1 oere per can, (0.397 cent per gallon, United States.)

The efforts of the company to reduce the expense of transportation has met with great success. They now receive the cream in high vessels of tinned sheet-iron, from distances of fifty to seventy English miles, in winter per wagon, in the summer per ship, &c.; nothing is drawn from the immediate vicinity of the capital.

The smallest quantity accepted is 10 cans, (26.17 liters or 6.914 quarts, United States.) Immediately after purchase, the cream delivered under one name is weighed, and then (especially in the warmer season) placed into large oblong vats filled with ice-water, after which each quantity under one name is converted into butter, in order to notice the result in butter of each and to compute its higher or lower price. One can (6 pounds = 5.62 pounds, United States) of cream yields at an average 1½ pounds (1.405 pounds, United States) butter. (One United States gallon cream = 2.50 United States pounds butter.)

The butter destined for exportation is variously treated; that for the London market has added 5 or 5½ per cent. of salt; for the Scotch market 4 per cent. only, and that for St. Petersburg (Paris butter from boiled cream) remains unsalted.

The butter prepared in the Stockholm establishment leaves daily from 2,000 to 3,000 cans (1,382 to 2,074 gallons, United States) of butter-milk, which, as before stated, sells at 7½ oere per can, (2.64 cents per gallon, United States.) The butter is prepared in five vats, 3 each of 60 cans, (41.48 gallons,) and two smaller. Care is taken that the temperature of the cream, when filled into the vats, has 12° (celsius) in the warmer, 14° in the cold season. Even in summer the cream is not suffered to pass above 14°, and in order to regulate the temperature a thermometer-pipe is attached to each vat, and the required degree can be enforced by addition of ice-water. The vats are upright wooden vessels, ranged in one line and put in motion by a steam-machine of four-horse power.

On the first day the butter gained is washed and then pressed, after which it is placed in cylindrical sheet vessels, which are standing over one night in ice-water. The next day another pressing of the butter takes place, when it is packed for shipment. During this process it loses about 3 per cent. in weight. In August, 1871, a pound of butter cost about 90 oere per pound, (26.41 cents per pound, United States,) and the Paris butter 1 rixdaler, (27.56 cents, gold, United States.) The price of butter is fixed at the beginning of each month. The trade with England draws at three days' sight, which secures a rapid return of the capital invested.

Ice is obtained in Stockholm at 30 oere per 100 pounds Swedish, (8.32 cents, gold, per 100 pounds, United States;) the establishment, from July 1 to October-1, consumed 5,000 quintals. A cover of saw-dust and turf-earth keeps the ice with a loss of only 15 per cent. Stores of ice are very large in Stockholm, and the climate admits of safe places of keeping, so that ice two years old is always at disposal.

The association in Stockholm exported not only the products of its own and branch establishments, but also of other co-operative and private dairies, at a commission of 3 per cent., under guarantee for the payment of the products sold. The following shows the total exports:

	FIRST CLASS.		SECOND CLASS.		THIRD CLASS.		TOTAL.	
	Kegs.	Pounds.	Kegs.	Pounds.	Kegs.	Pounds.	Kegs.	Pounds.
Central station, Stockholm.	6, 155	603, 902	573	55, 352	12	1, 197	6, 739	660, 452
Branch station, Oerebro....	1, 273	120, 057	444	43, 052	32	3, 109	1, 749	163, 218
Branch station, Skultuna....	921	90, 436	620	60, 372	32	3, 105	1, 573	153, 913
Branch station, Nyköping....	757	76, 977	69	6, 716	3	305	859	83, 998
Branch station, Eckilstima, (6½ months).....	190	19, 105	45	4, 420	-----	-----	235	23, 525
Branch station, Ultuna, (8 months).....	197	19, 614	17	1, 675	-----	-----	214	21, 289
Branch station, Nortelji, (1 month).....	6	446	1	63	-----	-----	7	509
Other dairies.....	2, 888	280, 759	636	64, 118	3	310	3, 527	344, 187
Total.....	12, 417	1, 211, 296	2, 404	235, 769	82	8, 026	14, 903	1, 456, 091

Further details, especially the financial results which have been successful, are promised at an early day. A statement of the products of the Stockholm establishment and its branches by months (of the year 1871) shows a decrease in the last part of the year, ascribed to the great number of young calves at that season.

Month.	Total product.	Central station, Stockholm.
	<i>Pounds.</i>	<i>Pounds.</i>
January .....	63, 523	44, 115
February .....	73, 295	45, 038
March .....	101, 230	61, 890
April .....	113, 860	65, 840
May .....	135, 550	72, 420
June .....	117, 880	63, 680
July .....	124, 920	76, 530
August .....	105, 070	65, 380
September .....	97, 740	58, 960
October .....	83, 890	52, 700
November .....	67, 260	45, 090
December .....	67, 500	38, 980
Total .....	1, 201, 718	695, 623

Total exported.....	<i>Pounds.</i> 1, 456, 891
Less .....	344, 187
Total .....	1, 112, 704
Sold in Stockholm or neighborhood.....	89, 014
Total production .....	1, 201, 718

*Swedish measurement.*—1 pound = 0.93697 pound, United States, avoirdupois, (or 1 pound, United States = 1.057 pounds, Swedish;) 1 quintal = 100 pounds, Swedish; can (kande) = 0.69139 gallon, United States; 1 gallon, United States, = 1.446 cans. Swedish; 1 rixdaler = 100 oere = \$0.2756 gold, United States.

*Results of agricultural expositions in Prussia during the year 1871. Prepared for the Department of Agriculture, by A. W. Angerer, of the Bureau of Statistics of the Treasury Department.*

Expositions by the central agricultural associations of—	Number.	Receipts in thalers.					Tickets.		Number of expositors.	Total number on exposition.	Exposition of animals.						
		From the state.	Central agricultural associations.	Special agricultural associations.	Other, inclusive from tickets.	Total.	Number sold.	Gross receipts.			Horses.	Cattle.	Sheep.	Goats.	Swine.	Poultry.	Other.
Prussia .....	4	250	100	352	1,911	2,613	4,198	1,399	212	974	323	276	238	123	14	80	
Brandenburg .....	15	100	1,186	1,242	2,668	5,196	7,596	2,182	698	1,144	427	263	188	77	95		
Pomerania .....	5	673	700	18	1,498	2,889	600	100	65	562	458	104*		14			
Silesia.....	20		1,270		14,220	16,356	35,955	13,893	693	1,202	404	714	79	2			
Saxony.....	8	1,250		1,007	4,718	3,975	6,152	1,603	762	1,751	820	517	272	23	29		
Schleswig-Holstein .....	12	1,150	350	2,431	4,040	7,971	12,782	2,919	1,262	1,477	383	863	149	1	58		
Hanover .....	57	2,650	3,029	4,709	12,223	22,611	29,414	11,745	2,378	5,295	1,333	2,094	593	16	654	531	
Westphalia .....	31	1,154	1,278	4,726	10,142	17,300	41,711	8,982	2,479	3,575	1,215	1,865	74	68	265	90	
Hesse-Nassau .....	4	720	1,578	1,440	3,395	5,833	23,896	3,230	254	311	6	277	4	16	8		
Rhenish Prussia .....	12	975	511	1,434	13,272	16,192	20,621	13,300	784	960	167	553	60	12	116	16	
Holenzollern .....	1		172	28	.....	200	4,000	914	80	112	36	54	10	12	36		
Total, state of Prussia .....	169	8,922	10,174	16,933	65,087	101,136	186,955	60,412	9,607	17,363	5,592	7,476	1,687	136	1,567	836	
																104	

\* Young colts.



Expositions by the central agricultural associations of—	Number of expositors—		Machines and implements.		Prizes awarded.				The prizes were awarded on—												
	Of products of field, garden, orchard.	Of bee and silk culture.	Number of expositors.		Amount in money.	Consisting in—			Diplomas.	Horses.	Cattle.	Sheep.	Goats.	Swine.	Poultry.	Other animals.	Products of—		Machines and implements.	Other objects of agriculture.	
			Prussian.	Foreign.		Total.	Medals.	Illustrations of animals.									Other gifts.	Field, garden, orchard.			Bee and silk culture.
Prussia .....	27	2	28	1	418	54	3	16	71	330	44	18	26	15	15	399	5	174	39		
Brandenburg .....	90	6	101	101	619	38	—	2	24	461	283	160	3	65	15	636	15	—	—		
Pomerania .....	56	9	—	—	1,202	14	—	19	54	531	—	—	—	—	—	136	10	282	—		
Silesia .....	21	2	235	—	2,914	15	1	11	—	1,228	1,079	57	121	—	—	13	2	—	—		
Saxony .....	18	5	13	21	1,774	21	6	59	5	897	731	119	4	90	3	149	—	—	—		
Schleswig-Holstein .....	65	8	116	—	3,517	4	—	2	298	1,466	1,594	151	115	12	—	149	—	30	—		
Hanover .....	413	9	544	54	10,503	—	63	50	303	5,818	3,147	293	13	674	38	53	214	11	189		
Westphalia .....	227	6	58	9	4,882	17	3	6	38	1,751	1,978	42	34	285	26	6	162	47	193		
Hesse-Nassau .....	38	—	48	48	2,007	1	—	—	19	54	435	7	35	6	—	—	—	—	—		
Rhenish Prussia .....	320	82	67	1	3,545	66	—	31	51	519	621	27	9	90	20	16	275	162	25		
Holstein .....	—	—	—	—	195	—	—	—	—	58	118	6	—	13	—	—	—	—	—		
Total, state of Prussia .....	1,277	123	1,210	86	32,575	230	76	196	863	14,113	9,930	850	63	1,523	120	90	2,004	256	1,064		
Total, state of Prussia .....	1,277	123	1,210	86	32,575	230	76	196	863	14,113	9,930	850	63	1,523	120	90	2,004	256	1,064		
Total, state of Prussia .....	1,277	123	1,210	86	32,575	230	76	196	863	14,113	9,930	850	63	1,523	120	90	2,004	256	1,064		

## FACTS FROM VARIOUS SOURCES.

**SILK-CULTURE IN KANSAS.**—In the Annual Report of this Department for 1870 it was mentioned that Mr. E. V. Boissiere, a wealthy French gentleman, had engaged in the culture and manufacture of silk at a place which is now called Silkville, near Williamsburgh, in Franklin County, Kansas; and a general description was given of the buildings and machinery already completed by Mr. Boissiere, and of his prospective arrangements for extending his enterprise. The Department has received a letter from Mr. Boissiere, under date of the 12th instant, in which he makes the following statement of the result of his first experiments during the past season :

I commenced the weaving of silk-velvet ribbons at this place in 1869, hoping to make it a successful business. I conceived the idea of attempting, in connection with it, to raise the silk itself. Accordingly, I procured from France, and planted in the spring of 1870, a sufficient quantity of the seeds of the white mulberry, the leaves of which constitute, almost exclusively, the food of silk-worms in that country. The seeds germinated satisfactorily, and produced trees which have made a remarkably rapid and luxuriant growth. I have 10,000 of them, yielding in the proper season as much, and apparently as good foliage as could reasonably be desired.

Last spring I received from France three ounces of silk-worm eggs. Of these, two ounces (one ounce each, of the yellow and white varieties) hatched on the 27th of April. They appeared to do well until the time of spinning, about the 2d day of June, when the worms died in such large numbers that the yield was only 20 pounds of cocoons, instead of 200 pounds, which is understood in France to be the average yield from two ounces of eggs. The third ounce, which I considered more promising than the others, and on which I relied more confidently, hatched the 15th day of May. The worms were at first lively, and appeared perfectly healthy, and so continued until the intensely warm weather of the first part of June, when they began to sicken and die, and so many of them died before spinning that I obtained barely 5 pounds of cocoons—only one-half, proportionally, of the scanty yield from the first hatching. It is perhaps proper to remark, that the weather, during the months of May and June last, was especially unfavorable to silk-worms, being very wet, and heavy thunder-showers being frequent. But, besides these adverse circumstances, which may be regarded as only occasional, I suspect that French silk-worms, having become habituated to the comparatively moderate summers of Europe, cannot well endure the change to the sultry summers of Kansas. I hope for better success with the Japanese variety, with which I propose, if possible, to experiment next year. From the cocoons produced by the first hatching this year I obtained very good eggs, but I have more confidence in Japanese eggs.

**MOULE'S EARTH-CLOSET.**—Dr. Fergus, of Glasgow, in a recent paper read before the Medico-Chirurgical Society of Edinburgh, on the sewage question, makes the following remarks upon the earth-closet system of the Rev. Henry Moule, of England, which was fully described, with drawings illustrative of its mechanical arrangement, in the Annual Report of this Department for 1871:

Mr. Moule's earth-closet has done well in private houses, asylums, and small villages in this country, and in India has been a very decided success. The great objection to its use in towns is the bulk of the material required. This objection is removed by employing, as Mr. Stanford proposes, seaweed charcoal instead of earth. As a very small quantity of charcoal is sufficient, by an improved closet, it is expected that even less than weight for weight of excreta will be found sufficient. I have repeatedly seen Mr. Stanford's process in operation, and am convinced it is in every way well worthy of trial; as it satisfies, in all respects, whatever the most ardent sanitarian could desire. The product from the closet is a black mass, somewhat like cinders, free from smell, and without the least appearance of fecal matter. Mr. Stanford considers that 8 cwt. per head per annum is sufficient, and that this need only be removed once a year; and the reservoir of char at the top of the house need only be replenished once a year. The closets are arranged to be quite automatic, and require no attendance from within. Mr. Stanford values the char after use at 8s. a head per annum, and proposes to burn it in revolving retorts, and to collect in suitable condensers the gas-liquor, tar, and gas. The charcoal increases at each reburning, and therefore the

plan is self-supporting, unless, indeed, the increased value of the char should render it advisable to sell it.

**STEAM-CULTIVATION IN SCOTLAND.**—There is evidence of great improvement in the agriculture of the north of Scotland; and it appears to have been promoted by reducing the size of home farms to smaller and more manageable dimensions, few of them now exceeding 200 acres, by a judicious system of rotation of crops and a more liberal use of manure; and by steam cultivation. It is claimed that the introduction of the steam plow has been the chief agent of the great changes which have been produced in the direction of profitable husbandry. A larger breadth of land has been brought into cultivation, and immense tracts of waste land, hitherto covered with heath, have been reclaimed and rendered capable of producing good crops of cereals, vegetables, and grasses. Thousands of acres of moss, and heavy clay, and hill-side lands, which could not be reached by ordinary methods of culture, after being trenched and drained have been brought by the steam plow and harrow into a cultivable state. Where neither men nor horses could be employed, the steam plow has been made to tear through everything. To avoid the risk of the breakage of gear in rough land, where the plow is liable to come against boulder stones and old tree-roots, a plow with a revolving coulter has been introduced—that is, a coulter which will cut its way smoothly until it meets with a root or stone, when it will pass over it with a rotary motion.

**THE FOREIGN HOP-CROP.**—The hop crop in England the present year is said to be remarkably fine, being large, heavy in quantity, and superior in quality. It is described as being the fifth largest crop of the century. The growth will average half a ton per acre. As 60,000 acres were cultivated, the yield will be, therefore, 30,000 tons, which is said to be an excess of 7,500 tons over the annual requirements of the brewing trade of the country. The Belgium hop prospects are also represented as being remarkably heavy; and at Nuremberg the crop will be from one-third to one-half more than last year. From Pleinfeld, in the celebrated Späلت district, a good average produce is expected. In the lower Palatinate (Rhenish Bavaria) one-fifth more hops were grown the present year than in the last season. From Hanover, likewise, and indeed from almost all the hop-growing districts of Europe, alike favorable accounts are received. The German, French, and Belgian crops are represented as being of superior quality, the portion of brown or diseased hops being unusually small. The estimated value of this year's crop in England is \$18,000,000. Although there is an increased consumption in Germany, France, and Belgium, there will be a considerable surplus for exportation in all those countries. In the United States the crop will not supply the home demand, although, according to the agricultural census, the crop is sevenfold what it was in 1850, the State of New York producing two-thirds of the whole amount; so that large importations from both England and the continent are anticipated.

**NEW SYSTEM OF LAND-TENURE IN EGYPT.**—In the monthly report of the Department for July, reference was made to the rapid increase of the area of cultivable lands in Egypt, resulting from the wise improvements of the present Khédive, whose aim is to ameliorate the system of land tenure, so that there may be something like private ownership of land. Egypt proper is estimated to possess about 5,000,000 acres of arable land, four-fifths of which is state property, the tenants who occupy it having nothing like a freehold or fee simple, and no title in fact



or privilege in the land, except that of occupancy and enjoyment of its produce by paying an annual tax. This tax is heavy and onerous, averaging between seven and eight dollars an acre upon the lands of the delta—that portion of the country which is enriched by the Nile—and a much less, but yet comparatively burdensome, sum upon the inferior lands in a country rarely visited by showers. The new system which has been initiated is to allow the tenant, by the payment of a sum equivalent to six years' taxation, to become, in a partial sense at least, the owner of the land which he occupies, with all the advantages attaching to a freehold, except the ultimate right to transfer or sell.

**CROSS BETWEEN THE ZEBU AND EUROPEAN CATTLE.**—The Department has recently received from Prussia, in exchange for its own reports, a variety of official agricultural publications. The "*Landwirthschaftliche Jahrbücher*," which is the organ of the Royal Prussian agricultural department, contains a notice of some experiments on the cross between the zebu or Indian ox (*Bos Indicus*) and European cattle, by W. Nathusius-Konigsborn. The doubts that have existed in regard to the fecundity of this cross led to the experiments which, the writer thinks, must forever set the question at rest. The male zebu made use of was a yearling calf from the zoölogical gardens, of the peculiar bluish white color characteristic of the zebu race. Four heifers of Holland stock were got with calf by this animal, and produced two heifers and two bull calves, all of which were successfully raised. Though the dams were variously colored, all the calves had white stars in their foreheads. When they arrived at suitable age they were bred with each other and with other cattle, and both sexes proved in every respect capable of propagating their race. The amount of milk given by the half-bloods was about 500 quarts per annum. This was so much below the ordinary average as to prevent all hope of their being a desirable breed. In addition the oxen, from which much was expected in speed and endurance, proved so incorrigibly obstinate as to defy all efforts to train them for the yoke, lying down on the smallest provocation, and in one case where it was necessary to lead one of them a short distance, the animal died the next day, it was supposed from the effects of anger and excitement. They acted much more like half-tamed wild beasts than like domestic cattle. The only redeeming feature was the quality of their flesh, which, in those that were sent to the butcher, proved to be excellent.

**TOBACCO IN OWEN COUNTY, KENTUCKY.**—R. W. Orr, secretary of the County Agricultural Association, writes to the Department, under date of October 15, that the tobacco crop of that county for the year 1872, in quality, is much superior to any other for the past five years; and that Owen County has the finest crop this year of cutting leaf of any county in the State, or even the Union; and it is now claimed that that kind of tobacco is the finest placed upon the Cincinnati or Louisville markets, which are the principal points for the sale of their crop. It is claimed that the day is not far distant when the Owen County tobacco will be favorably known all over the world for its superior qualities for chewing.

The eleventh annual exhibition of the Owen County Agricultural Association, just closed, proved quite a success, holding five days. The third day is called the tobacco day, upon which are exhibited samples of the best cutting leaf tobacco, White Burley, Red Burley, and Twist Bud. The show of tobacco on that occasion was the finest ever exhibited there, and the samples were afterwards sold at public auction

for one dollar per pound, and were purchased by one of the largest tobacco firms in Cincinnati.

**OPIUM-POPPY IN FRANCE.**—The cultivation of the opium poppy in France is steadily increasing. It now occupies 50,000 acres, of the value of 4,500,000 francs, yielding opium to the value of 2,000,000 francs a year. Different samples of opium, raised in various parts of Europe, are said to have yielded from 8 to 13 per cent. of morphine.

**ORANGE-CULTIVATION IN LOUISIANA.**—In the orange district in Louisiana there is a gradual extension of groves and an increase in production. In Plaquemine Parish about 2,000 acres are occupied by orange groves. Usually there are 100 trees to the acre, and a healthy tree will bear from 500 to 2,000 oranges, 1,000 being a fair average. They are worth on an average \$10 a thousand.

**HOPS IN CALIFORNIA.**—A hop circular, issued August 1, by Miller & Co., of San Francisco, gives some interesting facts relative to hop-growing in that State. There were under hops in the State in 1870 441 acres; 1871, 332; 1872, 618. There were exported from the port of San Francisco in 1870, 383,982 pounds; in 1871, 223,475 pounds; in 1872, up to August 1, 46,697 pounds. The imports were, in 1870, 1,137 bales; in 1871, 825 bales; in 1872, up to August 1, 479 bales, a bale being about 200 pounds. It will be noticed that in 1871 there was a large falling off from 1870 in acreage, exports, and imports, but a great increase of acreage in 1872, caused by a growing appreciation of the home product on the part of brewers. The estimated yearly consumption in the State is 450,000 pounds. The product in 1870 was 557,118 pounds; in 1871, 277,055 pounds. There was, August 1, a prospect of a fair average crop this season.

**IMPROVEMENT OF SOIL BY GREEN-MANURING.**—A correspondent at Port Gibson, Mississippi, believes a large portion of the South have reached the conclusion that their prosperity henceforth must depend mainly on improvement of the soil, and that, for securing this result, there is no other means so abundant, certain, and cheap as green-manuring. He also expresses the opinion that, in that latitude, the most valuable of the grains for forage, winter-pasture, and green-manuring is rye.

**A FRUIT-GROWING REGION.**—A correspondent in Lunenburg County, Southern Virginia, represents that fruit is easily produced in that region, but scarcely any attention is given to its culture, none being raised for market. Peaches grow almost spontaneously, and ripen from June till October, but are only raised for swine and for making brandy. Though pears grow and yield abundantly, only the poorest varieties are raised, mainly for the manufacture of perry. All kinds of grapes which have been tried thrive, but few are cultivated. Said a neighbor, "What is the use, when, with my little hand cider-mill and a negro to help, I can go into the woods and in a half day make 10 gallons of as good wine as ever was drank?" Apples do well, though more liable to decay than further north. Plums and cherries do better than he has ever known them to do elsewhere. Wild strawberries, raspberries, dewberries, and blackberries abound, and prunes, pomegranates, quinces, and figs can be raised, and are, to some extent, in gardens.

**GOODHUE, MINNESOTA, FARMERS' CLUB.**—Harrison Lowater, secretary, writes that its members had under cultivation, in 1871, 139 farms, with areas in principal crops as follows:

Wheat, 6,126 acres, yielding 83,498 bushels, or 13.6 per acre.



Oats, 1,487 acres, yielding 63,888 bushels, or 43 per acre.

Corn, 610 acres, yielding 20,985 bushels, or 34.4 per acre.

Barley, 942 acres, yielding 28,959 bushels, or 30.75 per acre.

The number of farms represented the present season is 158, with 9,985 acres in wheat, 1,753 in oats, and 472 in corn. In 1871 the average acreage to a farm was, of wheat, 44 acres; of oats, 10.7; of corn, 4.4. In 1872, of wheat, 63.2; of oats, 11.1; of corn, 3.

**EXPERIMENT IN GROWING POTATOES.**—Mr. James Wells, of Chicopee, Massachusetts, plowed deep and harrowed a piece of green sward, designed for a garden; dug deep holes three feet apart each way, put sods in the bottom, grass side down, and on them cow-stable manure, about two quarts in each hill; covered this lightly with soil, cut one bushel of early rose potatoes so as to have but one eye in a piece, and put two pieces in a hill, 6 to 12 inches apart. The ground was kept free from weeds, and the hills made "high and large." The product was 51 bushels of potatoes, 48 of which were of suitable size for the table. The ground measured 4,280 square feet, or a fraction less than one-tenth of an acre; and, therefore, the crop was at the rate of over 500 bushels per acre.

**BLACK-LEG.**—Our correspondent at Western Park, Howard County, Kansas, represents that a cattle disease prevailing in that locality, and known as black-leg, attacks young stock in about the following proportions: 70 per cent. of calves, 25 per cent. of yearlings, and 5 per cent. of two-year-olds. He recommends feeding freely with salt as a preventive, and as an antidote, the tincture of aconite, which he has tried with some success.

**EFFECTS OF COMMERCIAL FERTILIZERS IN COLD SOILS.**—Our correspondent in Milton County, Northern Georgia, represents that by the use of commercial fertilizers that county has been rendered as productive in cotton as the southern portion of the State. It is an elevated region, situated on a spur of the Blue Ridge which divides the Mississippi and the Atlantic slope, and the soil is a cold red loam or rotten clay. The stimulating fertilizer gives the cotton-plant an early start, and the weather is seldom, if ever, hot enough to cause it to wither or rust.

**ARMY OF SQUIRRELS.**—Our correspondent in Jackson County, Arkansas, reports that squirrels in large flocks are traveling through the county, and destroying entire fields of corn. They are so plenty that as many as 125 have been killed in a day by one man.

**DISEASE AMONG CALVES.**—Our report for September from Lawrence County, Indiana, states that quite a number of spring calves have died in that locality of a disease which runs its course in from three to five days; the several stages being stiffness, disinclination to move, and loss of appetite.

**TEXAS CATTLE-DISEASE.**—It is reported that at a locality in Boone County, Missouri, about twenty cattle have recently died of Texas fever; also that in Bates County, and in Christian County, Illinois, the same disease has broken out and is spreading with fatal effects. In the two former instances its origin is traced to droves of Texas cattle passing through the places, and in the latter to a herd of the same brought into the place by a stock-man.

**RAIN IN UTAH.**—Our correspondent in Kane County represents that, while rains have been so abundant as to damage late crops in some locali-



ties, they have brought the county generally into a fine condition for the winter range of stock, and that, according to his own observation and reports from all parts of the county, stock was never in a better condition for winter than now.

**CROPS IN GREELEY, COLORADO.**—N. C. Meeker, of Union Colony, has had ten acres of land in cultivation this season, from which he has gathered crops as follows:  $3\frac{1}{2}$  acres of wheat, 75 bushels; 2 of corn, 50 bushels; 1 of oats, 30 bushels; 1 of sugar-beets, 7 tons; 2 of Hubbard squash, 6 tons; and a half acre of cabbage, 7 tons. He represents that, for want of thorough cultivation the yield of beets was only about three-fourths of a crop, and that the corn suffered from being too thick.

**FRUIT IN KANSAS.**—A correspondent in Cowley County reports that its prospects for fruit-raising are very promising. Young fruit-trees generally are doing well; peach-trees only three years old have borne fine fruit, and in another year the county may expect a full supply of peaches and small fruits, and a year later, of apples and cherries.

**COCOA-NUT CABBAGE.**—This new variety, recently introduced by the Department, has been tested by a correspondent in Mercer County, Ohio, who commends it as early, hardy, yielding good heads, and of better flavor than any other variety he is acquainted with.

**CULTIVATION OF CINCHONA IN BENGAL.**—The cultivation of cinchona trees in the district of Sikkin, Bengal, which was started in 1862 by Dr. T. Anderson, is said to be very profitable, and in this district there were under cultivation in March, 1871, the following species: 1,233,715 trees of *cinchona succi rubra*; 440,000 trees of *cinchona officinalis*; 33,400 trees of *cinchona calisaya*; beside 480,000 young plants of *cinchona succi rubra* in the nursery, which had been raised from the seed. The annual yield is about three hundred pounds of bark per acre.

**THE AMOUNT OF ARABLE LAND OF THE NETHERLANDS.**—Nearly one-fifth of the entire surface of the Netherlands is wholly unfit for cultivation, while more than another one-fifth is meadow-land; about 71,500 acres are market gardens; 60,000 acres are orchards; 47,500 acres are cultivated with tobacco; 35,000 with hemp; 375 with hops, (in one district only;) and 500 acres are wholly devoted to the cultivation of the bulbs of tulips, hyacinths, &c.

## MARKET PRICES OF FARM PRODUCTS.

FOR OCTOBER, 1872.

Articles.	Price.	Articles.	Price.
NEW YORK.		NEW YORK—Continued.	
Flour, superfine State... per bbl.	\$6 10 to \$6 50	Rye .....	\$0 80 to —
extra State .....	7 10 to 8 00	Barley .....	1 07 to —
superfine western .....	6 10 to 6 50	Oats, .....	38 to \$0 46
extra to choice western,		Corn, western, mixed .....	64 to 65½
per barrel .....	7 10 to 11 25	Hay, shipping qualities .....	20 00 to 21 00
extra southern... per bbl.	7 70 to 10 00	prime .....	24 00 to 30 00
choice southern .....	10 50 to 12 50	Pork, mess .....	14 00 to 14 25
Wheat, No. 1 spring... per bush.	1 58 to 1 63	prime .....	11 25 to 11 75
No. 2 spring .....	1 50 to 1 57	Beef, plain mess .....	5 00 to 7 00
winter, red west'n. ....	1 63 to 1 73	extra mess .....	8 00 to 10 00
white, western .....	1 70 to 2 02	Lard, .....	8½ to 9½

## Market prices of farm products—Continued.

Articles.	Price.	Articles.	Price.
NEW YORK—Continued.		BALTIMORE.	
Batter, western.....per lb.	\$0 10 to \$0 22	Flour, superfine.....per bbl.	\$5 00 to \$6 25
State dairy.....do.	20 to 32	extras.....do.	6 50 to 8 50
Cheese, western dairy.....do.	11 to 13	family and fancy.....do.	8 00 to 12 00
State factory.....do.	11½ to 14	Wheat, red southern.....per bush.	1 40 to 1 85
Cotton, ordinary to good ordi-		choice red.....do.	1 90 to 2 00
nary.....per lb.	15½ to 18½	white.....do.	1 60 to 2 00
low middling to good		Corn, yellow.....do.	67 to 68
middling.....per lb.	18½ to 20½	white.....do.	72 to 74
Tobacco, lugs, all grades.....do.	9½ to 10½	Rye.....do.	75 to 85
common to medium		Oats.....do.	41 to 45
leaf.....per lb.	10 to 11½	Hay, western, new prime, per	
Wool, extra pulled.....do.	54 to 55	ton.....do.	32 00 to 34 00
California spring clip, per		old.....per ton	34 00 to 36 00
pound.....do.	33½ to —	Beef, mess city-packed.....per bbl	15 00 to 20 00
California fall clip, scoured,		extra.....do.	23 00 to 25 00
per pound.....do.	70 to 90	Pork, mess.....do.	15 50 to —
Texas.....per lb.	37½ to —	Butter, western.....per lb.	20 to 25
N. Y. State fleece.....do.	55 to 60	Glades.....do.	20 to 24
choice Ohio, XX.....do.	58 to —	Cheese, western factory.....do.	14½ to 15½
		eastern factory.....do.	15 to 15½
BOSTON.		Lard.....do.	8½ to 9
Flour, western, superfine.....per bbl.	5 25 to 6 00	Cotton, ordinary to good ordi-	
western extras.....do.	7 00 to 9 00	nary.....per lb.	— to 17½
western choice.....do.	9 25 to 12 00	low middling to mid-	
southern extras.....do.	7 00 to 7 50	dling.....per lb.	18 to 18½
choice Baltimore.....do.	10 00 to 12 00	Tobacco, lugs.....per cental	7 50 to 9 50
Wheat.....per bush.	1 60 to 2 00	common to medium	
Corn, southern yellow.....do.	74 to 75	leaf.....per cental	9 00 to 11 00
western mixed.....do.	71 to 73	Wool, fleece, common to fine,	
western yellow.....do.	74 to 75	per pound.....do.	45 to 50
Rye.....do.	85 to 90	tub.....per lb.	53 to 56
Barley.....do.	75 to 1 10	unwashed.....do.	36 to 40
Beef, mess.....per bbl.	10 00 to 11 00	pulled.....do.	40 to 43
extra.....do.	11 00 to 16 00	CINCINNATI.	
Pork, prime.....do.	11 25 to 13 00	Flour, superfine.....per bbl.	5 25 to 6 00
mess.....do.	15 75 to 16 00	extra.....do.	7 25 to 7 50
Lard.....per lb.	9 to 10	family.....do.	7 50 to 8 75
Butter, N. Y. and Vt.....do.	15 to 25	Wheat, choice Kentucky, per	
western.....do.	12 to 23	bushel.....do.	1 75 to —
Cheese, N. Y. and Vt. choice		prime State.....per bush.	1 65 to —
factory.....per lb.	13 to 14½	No. 1 winter red.....do.	1 55 to 1 75
N. Y. and Vt. choice		No. 2 winter red.....do.	1 52 to —
dairy.....per lb.	12 to 13½	Corn, white.....do.	44 to 45
Ohio factory, good to		yellow.....do.	44 to 45
choice.....per lb.	11 to 14	Oats, No. 1.....do.	35 to 36
Cotton, ordinary to good ordi-		No. 2.....do.	32 to 33
nary.....per lb.	15½ to 18½	Rye.....do.	70 to 72
low middling to good		Barley, choice.....do.	95 to 97
middling.....per lb.	18½ to 21	prime.....do.	90 to 92
Tobacco, lugs.....do.	9 to 9½	Hay, baled No. 1.....per ton.	19 00 to 21 00
common to medium		baled lower grades.....do.	14 00 to 18 00
leaf.....per lb.	10 to 12	Pork, mess.....per bbl.	13 25 to 30 50
Hay, eastern and northern, per		Lard, city kettle.....per lb.	8 to 8½
ton.....do.	20 00 to 29 00	prime winter steam.....do.	7½ to 7¾
western, choice.....do.	— to —	Butter, western reserve.....do.	24 to 25
Wool, Ohio and Penn.....per lb.	53 to 68	Central Ohio.....do.	21 to 23
Michigan.....do.	52 to 58	Cheese, prime to choice factory,	
other western.....do.	52 to 57	per pound.....do.	14½ to 15½
California.....do.	20 to 45	Cotton, ordinary to good ordi-	
Texas.....do.	35 to 45	nary.....per lb.	15½ to 17½
pulled.....do.	30 to 60	low middling to good	
combing-fleece.....do.	67 to 70	middling.....per lb.	17½ to 19½
PHILADELPHIA.		Wool, common to medium	
Flour, superfine.....per bbl.	4 25 to 5 00	washed-fleece.....per lb.	47 to 48
extras.....do.	5 50 to 6 25	medium to fine.....do.	48 to 50
family & fancy brands.....do.	7 75 to 10 50	tub-washed.....do.	50 to 55
Wheat, western red.....per bush.	1 70 to 1 75	unwashed cloth'g.....do.	30 to 35
amber.....do.	1 85 to —	unwashed, comb'g.....do.	46 to 48
white.....do.	1 90 to 2 00	pulled.....do.	35 to 37
Rye.....do.	— to —	CHICAGO.	
Corn, yellow.....do.	70 to —	Flour, winter extras.....per bbl.	9 50 to —
mixed.....do.	68 to 69	spring extras.....do.	6 25 to 7 25
Oats, new white.....do.	42 to 44	Wheat, No. 1 spring.....per bush.	1 23½ to 1 26
old white.....do.	49 to —	No. 2 spring.....do.	1 18½ to 1 20½
Pork, mess.....per bbl.	15 00 to 15 25	No. 3 spring.....do.	1 06 to 1 07
Lard, mess.....per lb.	9 to 9½	Corn, No. 2.....do.	35½ to 37½
Cotton.....do.	19 to 19½		

## Market prices of farm products—Continued.

Articles.	Price.	Articles.	Price.
CHICAGO—Continued.		NEW ORLEANS.	
Corn, rejected..... per lb.	\$0 34 to \$0 34½	Flour, superfine..... per bbl.	\$5 00 to \$6 00
Oats, No 2..... do.	23½ to 23½	extras..... do.	7 00 to 8 50
rejected..... do.	20½ to 21	choice..... do.	8 75 to 11 00
Rye, No. 2..... do.	55 to —	Corn, white..... per bush.	65 to —
rejected..... do.	46 to —	yellow..... do.	— to —
Barley, No. 2..... do.	67 to 68½	mixed..... do.	63 to —
rejected..... do.	38 to 48	Oats, ordinary..... do.	37 to 38
Hay, timothy (on track) per ton.	15 00 to 17 00	prime to choice..... do.	49 to 43
prairie..... do.	10 00 to 11 50	Hay, prime..... per ton.	24 50 to 26 50
Pork, mess..... per bbl.	14 50 to 15 00	choice..... do.	28 00 to 28 50
Beef, mess..... do.	9 00 to —	Pork, mess..... per bbl.	15 50 to 15 75
extra mess..... do.	10 00 to —	Beef, mess, (Texas)..... do.	11 00 to 11 50
Lard..... per lb.	7½ to 8½	Lard, tierce..... per lb.	9½ to 10
Butter, choice dairy..... do.	25 to 28	keg..... do.	11½ to 12
fair to good..... do.	16 to 22	Butter, choice western..... do.	22 to 24
Cheese, New York factory..... do.	14½ to 15½	Goshen..... do.	31 to 32
Ohio, factory..... do.	13 to 14	Cheese, choice western..... do.	18 to —
Wool, tub-washed..... do.	57 to 64	New York cream..... do.	18 to 19
fleece-washed..... do.	30 to 53	western reserve..... do.	— to —
pulled..... do.	44 to 47	Cotton, good ordinary..... do.	17½ to 18½
Flour, superfine..... per bbl.	5 00 to 5 75	low middling to good	
extras..... do.	6 00 to 7 50	middling..... per lb.	18½ to 19½
choice..... do.	8 00 to 9 50	Tobacco, lugs..... do.	8½ to 9½
Wheat, spring..... per bush.	1 15 to 1 25	low leaf..... do.	9½ to 10½
red..... do.	1 40 to 1 85	medium leaf..... do.	10½ to 11½
white..... do.	1 55 to 1 90		
Corn, mixed..... do.	36½ to 42	SAN FRANCISCO.	
yellow..... do.	— to —	Flour, superfine..... per bbl.	4 00 to 4 25
white..... do.	— to —	extra super..... do.	4 50 to 4 75
Oats, white..... do.	29 to —	higher grades..... do.	5 00 to 5 50
mixed..... do.	27½ to 28	Wheat, State..... per cental.	1 45 to 1 65
Rye..... do.	57 to 70	Oregon..... do.	1 60 to 1 75
Barley..... do.	55 to 1 00	Corn, white..... do.	1 70 to 1 75
Hay..... per ton.	14 00 to 22 00	yellow..... do.	1 60 to 1 62½
Pork, mess..... per bbl.	14 50 to 14 75	Hay, State..... per ton.	10 00 to 16 00
Lard, tierce..... per lb.	9½ to 9½	Pork, mess..... per bbl.	17 00 to 20 00
keg..... do.	10½ to 11	prime mess..... do.	17 50 to 18 00
Butter, choice..... do.	25 to 27	Beef, mess..... do.	12 00 to 13 00
medium to fair..... do.	20 to 23	Lard..... per lb.	10½ to 11½
Cheese, Ohio factory..... do.	14½ to 15	Butter, overland..... do.	20 to 25
New York..... do.	14½ to 15½	California..... do.	30 to 45
northwest'n fact'y..... do.	14½ to 15	Oregon..... do.	20 to —
Cotton, middling..... do.	18 to 18½	Cheese..... do.	11 to 15
Tobacco, lugs..... per cental.	8 00 to 9 25	Wool, native..... do.	12 to 20
common leaf..... do.	8 25 to 9 75	California..... do.	20 to 25
medium to good leaf,		Oregon..... do.	30 to 35
per cental..... do.	10 00 to 11 50		
Wool, tub-washed..... per lb.	58 to 60		
unwashed..... do.	30 to 38		



